NOV. 11 1960

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Equipment standardization is being jeopardized . . . 17

Producers find selling oil more expensive . . . 20

How many supply stores are necessary? . . . 34

Radiation grafting makes better polymers . . . 76

Steel alloy cuts cost of liquefied-gas tanks . . . 102

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PETROLEUM WEEK **NOVEMBER 11, 1960**
Vol. 11, No. 19

Published weekly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), founder. Publication office: 371 N. Franklin St., Chicago 10, Ill. See panel below for directions regarding subscriptions or change of address.

Executive, Editorial, Circulation and Advertising offices: 330 W. 42nd St., New York 36, N. Y. Officers of the Publications Division: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. Officers of the Corporation: Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary.

Subscriptions are solicited only from executives, supervisors, and technically trained personnel in the oil and natural gas industries, who are engaged in exploration, drilling, producing, processing, petrochemical manufacture, transportation, or wholesale marketing. Position and company connection must be indicated on subscription orders. Subscription rates for all countries: $5 per year. Single copies 50¢. Second class postage paid at Chicago, Ill. Printed in the U.S.A. Title registered in U.S. Patent Office.

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Subscriptions: Address subscription correspondence and change of address to Fulfillment Manager, Petroleum Week, 330 W. 42nd Street, New York 36, N. Y. On address change please give old and new addresses and zone numbers, if any, and enclose an address label from a recent issue if possible. Please allow one month for change to become effective.

Postmaster: Please send form 3579 to Petroleum Week, 330 W. 42nd St., New York 36, N. Y.

INSIDE Slant

ASSISTANCE IS NEEDED

A problem that is very basic and critical to the manufacturer-supplier segment of the petroleum industry will be discussed in Washington Dec. 6.

For some time, the government has maintained a program of talking over problems with representatives of industrial groups.

Thirty-three representatives of those who make and supply equipment will have this opportunity at the December meeting.

They will try to get action started on the tough problem of meeting foreign competitors on even terms in the matter of financing overseas sales.

In trying to compete abroad, U.S. firms constantly face this kind of situation:

A competitor will offer his product on a no-down-payment, 3-to-5-years-to-pay basis.

The competitor can do this because he is, in effect, subsidized by his government.

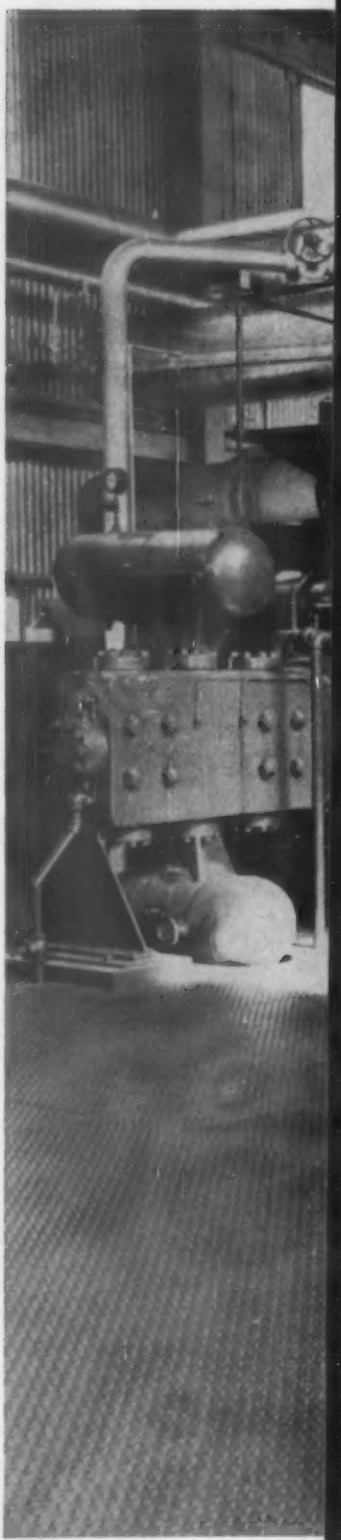
Either his government will take over most of the notes, or it has some banking arrangement set up to do so.

No U.S. company or banking house can afford to carry such a financing arrangement.

If U.S. firms are to compete, then there should be the facilities.

LeRoy Menzing

Noel M. Champion *(left), Chief Engineer, Armour Agricultural Chemical Company, discusses a technical problem with* Robert L. Kietzman, *Sales Engineer, The Cooper-Bessemer Corporation, St. Louis District Office.*



How Cooper-Bessemer service helps keep the ammonia flowing

At Armour Agricultural Chemical Co., Crystal City, Missouri, nine Cooper-Bessemer compressors play key roles in the manufacture of ammonia products. Round the clock, for five years, these units have given exceptional performance under the rigors of such problems as handling pressures up to 9000 psi.

The performance of these C-B compressors has been backed by Cooper-Bessemer engineers in the St. Louis area and in Mt. Vernon, contributing helpful service for these high-pressure operations.

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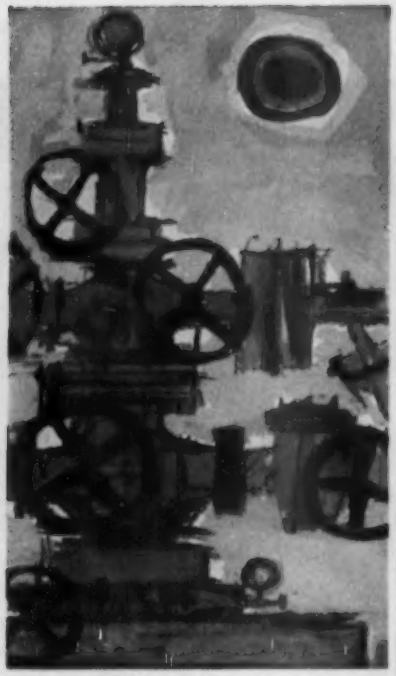
Noel M. Champion *(left)* and Thomas H. Ferebee, *Supt. Ammonia Plant. In background are two GMWA-10, four GMWA-8 and one GMWA-6 engine driven compressors for compression of air, natural gas, synthesis gas and ammonia. Armour also has two FM compressors for ammonia recirculators.*



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Views That Make News

Dear Sir:

First of all, I'd like to thank you for the fine coverage you have given the sixth annual Hoods Up survey "What Will Replace the Lube Job?" [PW—Oct.14'60,p44]. We are very pleased.

There are, however, some points that we feel ought to be clarified to avoid any misunderstanding.

The survey under discussion is the sixth annual Hoods Up survey of service station training needs. Your readers may not recognize Washburn & Co., which is our new corporate name. As you may know, Hoods Up, which we publish, is a monthly service station training and sales development bulletin, sold on yearly contracts to petroleum marketers for distribution to their service station dealers. Our Hoods Up division also prepares quite a bit of the training and sales development materials used by the petroleum and TBA industries. We make the survey annually as a guide in preparing the coming year's Hoods Up program, and to give us background information which we can use in preparing special training and sales development materials for our clients . . .

I should also like to point out that the sampling we use consists of district and division merchandising and training specials and the merchandising representatives who actually call on service stations. This survey does not reflect training needs as seen by dealers themselves, nor does it reflect the thinking of high company management. We try to limit it to the company management group two or three levels above the service station. This year, questionnaires were distributed to about 3,300 people. We received 2,767 usable returns, representing 115,776 service stations, a rather large percentage of the market. . .

STEWART A. WASHBURN
General manager
Washburn & Co.

Dear Sir:

I would like to congratulate you upon the editorial headed, "Marketers Are Oil Men Too" [PW—Sep.2'60, p44]. The only change that I might have suggested would have been the heading. I would have used the word "dealers" in place of "marketers."

I attended the first three days of the National Congress of Petroleum Retailers and got the same impression as indicated in your editorial. It's certainly a discouraging experience to attend such a meeting. However, it seems to me that it's highly important that suppliers be represented to a much greater extent than they have been, even though this group represents only a minority of all dealers in the country.

Frankly, after working at this dealer relations job for over three years now, I find that we as suppliers are greatly at fault in allowing this condition to develop.

Certainly more is being done about this dealer situation than ever before, but I agree with you that, unless a lot more is done by many more suppliers, we are going to wind up with many more forms of government regulation and control in our industry than we now have.

W. P. MARQUAM
Manager
Pure Oil Co.

Dear Sir:

We note that an erroneous statement was made in the article "Purer Hydrogen—at Reasonable Cost [PW Sep.23'60,p88]; i.e., American Air Liquide is a representative of a foreign company. While American Air Liquide is affiliated with L'Air Liquide of France, we do all our design engineering and construction on this continent. We do not import engineering or equipment from Europe.

F. G. KERRY
Sales manager
Engineering and construction division
American Air Liquide, Inc.

"Should the importing companies start converting profits from foreign oil into domestic exploration, and this seems a perfectly logical and wise thing to do, they could not only stimulate the industry that made them all big and successful corporations, they could also utilize the services, the genius and the know-how of the men they are laying off, retiring early, and terminating."

—MICHEL T. HALBOUTY
Independent producer
Houston

PETROLEUM WEEK *will publish each week comments from readers on timely, pertinent subjects. Such expressions are welcome.*

Address all such correspondence to LeRoy Menzing, Editor, PETROLEUM WEEK, *330 W. 42nd St., New York 36, N.Y.*

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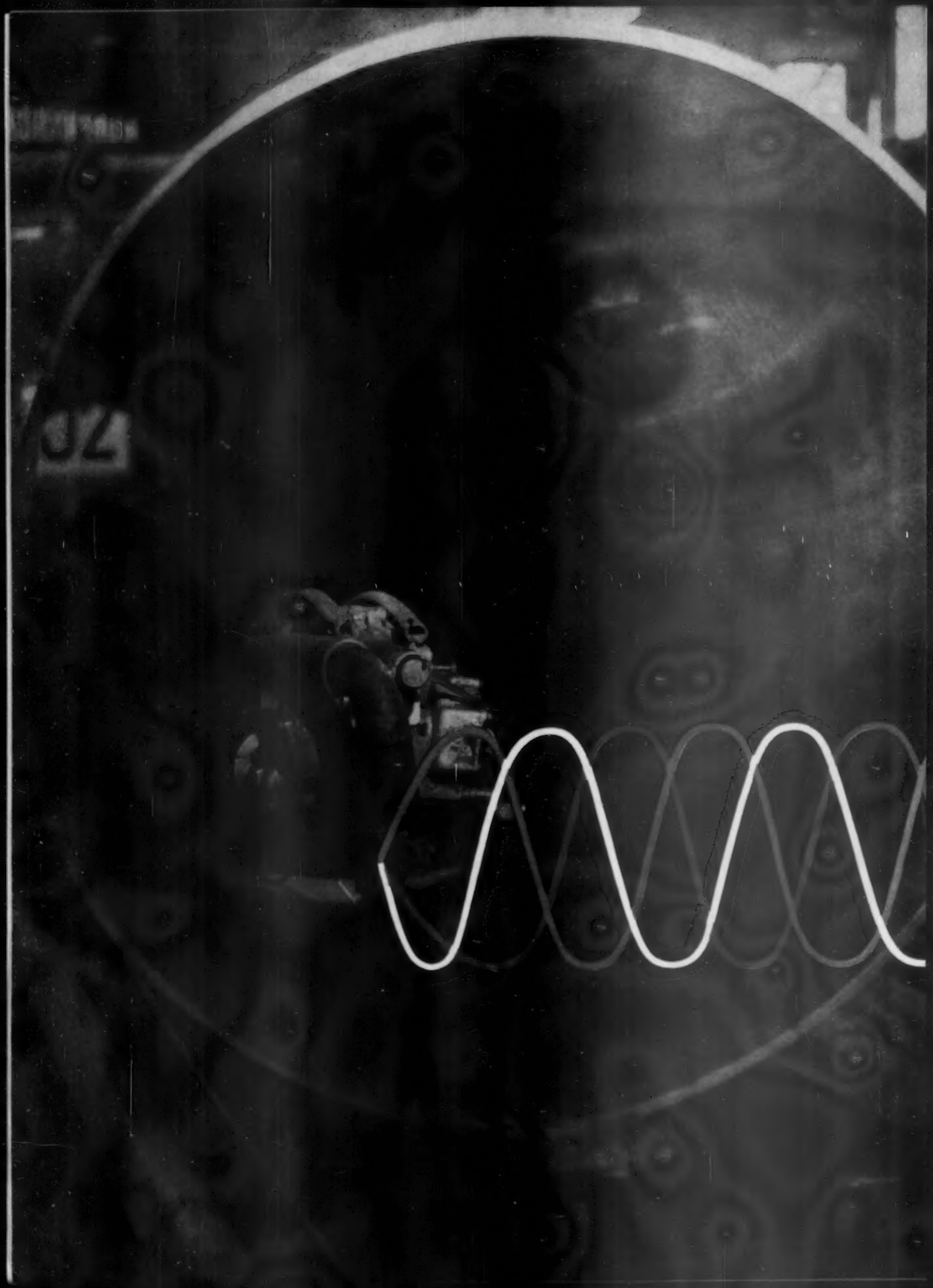

A private eye inside a line-pipe

This private eye at Großrohrwerk Mannesmann-Hoesch* is an electronic one and therefore able to watch every inch of the seam continuously from the inside during longitudinal welding. Control by TV is the most efficient way to ensure that you shall not have to dig up any section of your new Mannesmann-Hoesch pipelines. However, it is not the only way of testing; ultrasonic, magnetic, and X-ray methods are also available.
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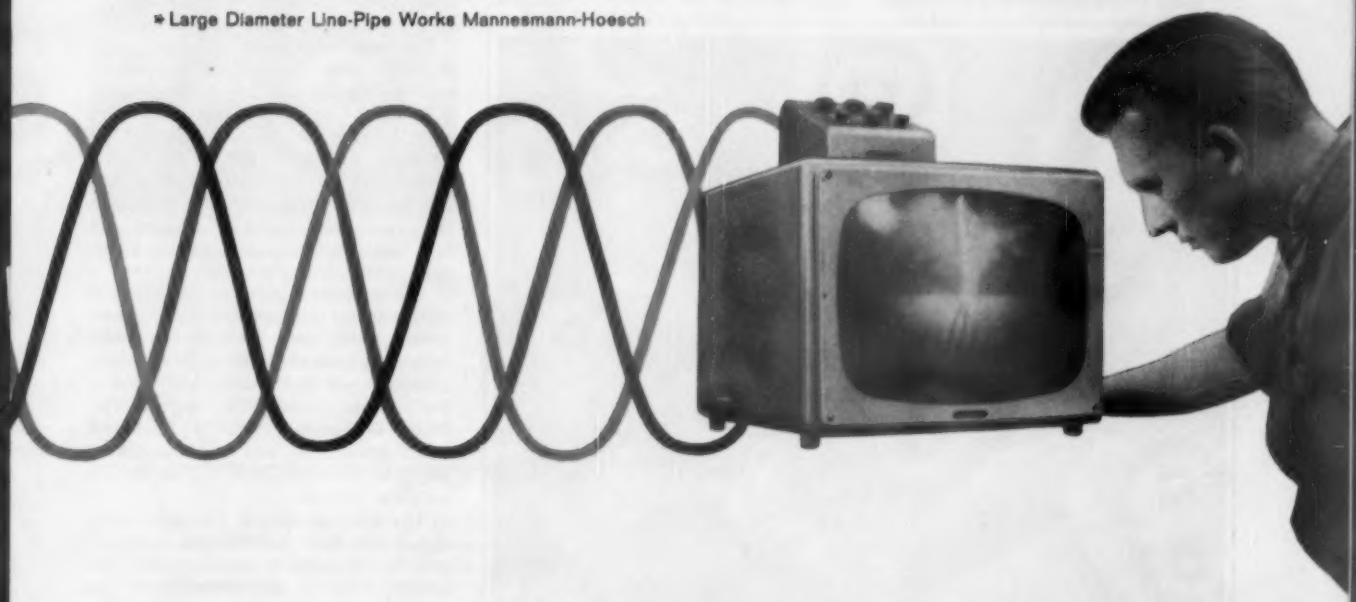
* Large Diameter Line-Pipe Works Mannesmann-Hoesch



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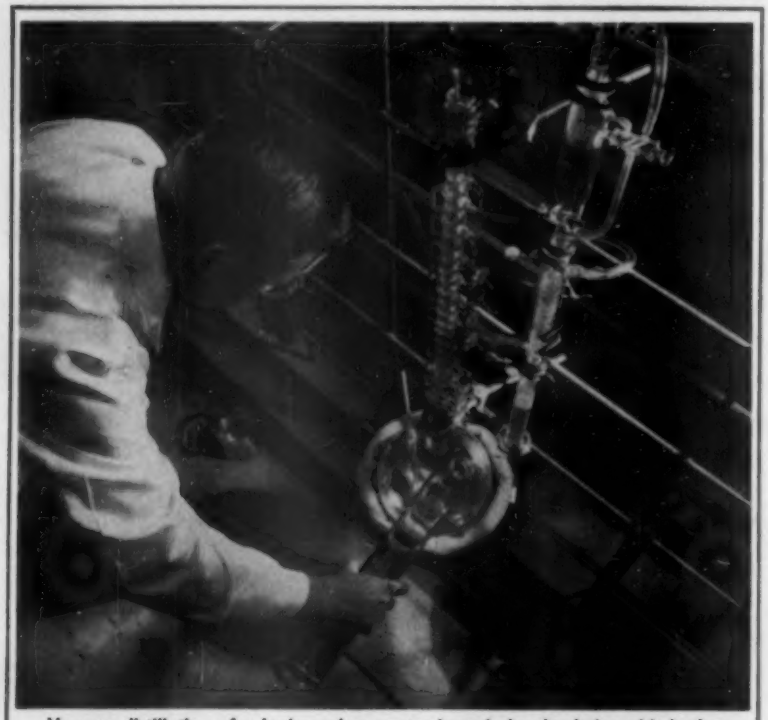
Dow is more than just a manufacturer of chemicals for the petroleum industry. Its diversified activities include basic research along many different lines, development of new chemicals, and assistance—both in the field and in the lab—to processors with problems. Dow's Petroleum and Gas Conditioning Laboratories often do basic research to help customers solve specific problems . . . then make the results of this research available to the entire industry. In this report, you'll see how Dow assistance and Dow chemicals are put to work.

LAB TRIO TAKES THE PROBLEMS OUT OF GAS PROCESSING

When Dow's Gas Conditioning Laboratory attacks a problem, they bring three big guns to bear on it.

One: long-experienced Dow chemical engineers whose business it is to trouble-shoot problems, right on the spot. Two: a staff of chemists with virtually unlimited laboratory facilities at hand. And three: a research program, designed to help solve problems common to the entire industry.

An example of the latter is Dow's recent research on activated charcoal.



Vacuum distillation of a hydrocarbon-contaminated glycol solution aids in the identification of the individual components of the system.

The study concerned an improved method of using this material to purify glycol and amine solutions in respect to hydrocarbon contamination, foaming and corrosion. Two major advantages which this method offers the petroleum industry are: resulting purity, in many cases comparable to vacuum distillation, and simplicity of operation.

For purifying glycol solutions, particularly under heavy flow conditions, two adsorption columns permit maximum operating efficiency—as exhausted charcoal is replaced in one column, the alternate column is put into use. Regeneration of the filter beds is not difficult. An occasional backwash will flush out solid particles choking the bed, while live steam will quickly eliminate light hydrocarbon contaminants.

The detailed report on the project is available to the industry on request. Among other data, the report includes information on methods of determining charcoal bed exhaustion; the specific use and placement of filter units; differences in handling gravity feed and batch operations; and a discussion of physical principles involved in the adsorption process.

The work of Dow's Gas Conditioning Laboratory touches all areas of petroleum industry interests. For example, research on corrosion in gas processing equipment was begun for a Dow customer. The result was not only complete solution of the primary problem, but also thorough development of data on the corrosion-inhibiting activity of sodium vanadate—information which is available to any company involved in gas conditioning.

Another instance of Dow's industry-

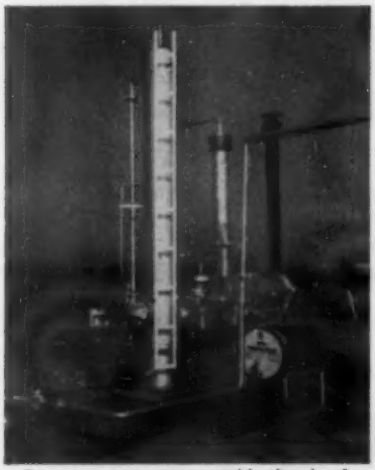
oriented approach to petroleum problems is the development of an improved method for analyzing certain components in natural gas. The method, as engineered by Dow, provides accurate results with advantages over conventional methods of speed, and simplicity of equipment—considerably less room than usual is required for the set-up. Best of all, analyses can be carried out economically by a competent technician.

These three projects are typical of Dow's wide coverage of the industry, and of the extent to which the Dow Gas Conditioning Laboratory becomes involved in customer problems. Detailed reports of the projects are available on request.

DOW GLYCOLS

. . . peerless extractors

The large family of glycols includes some of the most versatile of extractants to be found anywhere. They dehydrate gases in natural gas process-



Dow serves processors with glycols of highest quality and uniformity.

ing, prevent freezing of free water by injection into gathering systems, and recover aromatics from hydrocarbon feed stocks during refining operations.

Because Dow is basic in the manufacture of glycols—that is, Dow makes its own "starting point" chemicals—it can easily produce glycols of high purity and uniformity. This "basic" position as chemical producer gives refiners and gas producers definite advantages, some of which are: complete control of quality, from raw material to the finished compound; a wide range of chemicals to choose from; widespread production facilities; and fast delivery to any part of the country.

ETHANOLAMINES

. . . acidic affinity

The ethanolamines – monoethanolamine and diethanolamine – have a strong affinity for acid gases. Consequently they have great value for natural gas processors. An important use is the absorption of hydrogen sulfide and carbon dioxide from natural gas and process gas. As with other Dow chemicals, one mark of the Dow ethanolamines is their uniformity and purity.

The facilities of Dow's Gas Conditioning Laboratories are available to users of Dow gas processing chemicals, too. This means on-the-spot assistance by Dow Technical Service Representatives, when the problem requires it. Then there are the extensive files of gas conditioning case histories which Dow maintains . . . often a real short-cut in helping to solve gas scrubbing problems.

Refining and production, too . . .

DOWTHERM A . . .

heat's up—pressure's down

Dowtherm® A is Dow's double-duty organic heat transfer medium. Its high efficiency permits it to be used in either vapor phase or liquid phase. And it can also be used for *cooling*, if desired.

Dowtherm A gives you high rate of heat transfer, fraction-of-a-degree temperature control from 350° to 750° F., and low pressures, too! You can hold temperatures more uniform than with direct fire heating, and you get less carbonization and greater fuel savings, as well. When heating reboilers for regeneration of glycol, for example, Dowtherm A does not cause degradation of the glycol . . . as do the high skin temperatures encountered in direct fire heating. Now compare the low pressure of Dowtherm A with that of steam. At 700° F., steam is over 3000 psi. At this same temperature, Dowtherm is *only 95 psi!*

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Peladow® (Dow calcium chloride pellets, 94-97%) gives drillers a practical solution to the problem of trouble-free, high density completion brines. Peladow permits higher density brines than are possible with either sea water or sodium chloride. And with brines, there's no troublesome solidification or precipitation of solids . . . a problem often encountered with weighted packer muds in annular fillup.

For offshore and tideland operations, Peladow reduces rig and handling costs because it's so easily handled. And because it's the most concentrated form of active brine material available, freight costs go down, too. Write for a copy of the brochure "Peladow—Calcium Chloride For Oil Well Completion Brines."

DOWELL DIVISION is one of the largest service organizations of its kind. From general offices and laboratories in Tulsa, Dowell provides oil and gas well acidizing, formation fracturing, cementing services and chemicals. These services and specialty chemical products are available throughout the U. S., Canada, and in South America. For information, write Dowell, Tulsa 2, Oklahoma.

See "The Dow Hour of Great Mysteries" on TV.

HOW MANY WAYS CAN DOW HELP YOU? Consider the complete line of Dow processing chemicals, the ready assistance in solving problems, the long experience in every area of the petroleum industry. For more information on how Dow can help you, and for copies of the brochures described above, write THE DOW CHEMICAL COMPANY, Midland, Michigan, Chemicals Merchandising Dept. 504LR11-11.

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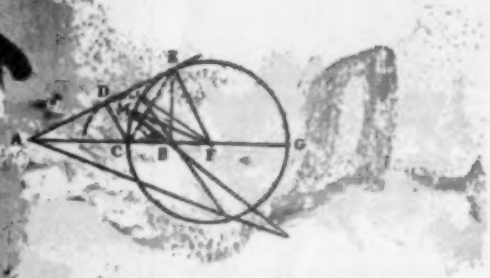
Within the same area of meaning, the quality of minds responsible for an engineering project can be evaluated only by results. When you check the record of Brown & Root's engineering through the years, the high quality of thinking reveals itself. Customer satisfaction from greater efficiency at lower costs has built a worldwide reputation for engineering and construction by Brown & Root.



"The knowledge of a single fact through a discovery of its causes prepares the mind to understand and ascertain other facts..."
Galileo

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60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

November 11, 1960

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Too many specialty items and variations are creating problems for equipment manufacturers and users. Concerned officials are wondering whether standardization is being defeated by innovations and extremes. . . . p. 17

•

Service stations are due for a face-lifting over the next five years. A Petroleum Week special report shows that increased emphasis on efficiency will force marketers to reshape everything from pumps to lube bays. . . . p. 62

•

Polymers such as nylon and polyethylene may be improved by radiation grafting. A new process is in the completion stage that will make the products take more easily to bonding, dyeing, and printing. . . . p. 76

•

One of the tackiest problems facing producers is the high cost of selling crude. They have to foot many costs formerly borne by buyers in order to market their oil. . . . p. 20

•

Productive overcapacity is triggering a drive toward fewer supply stores with larger inventories. A Petroleum Week survey shows that the competitive squeeze is forcing suppliers into consolidations, possibly toward "supermarket" outlets. . . . p. 34

•

Service station merchandising techniques have been blasted as "worse than pathetic" by a New York advertising executive. He says that service stations have changed less than any other basic type of retail outlet in the past ten years. . . . p. 94

•

Look for a doubling of drilling activity in northeastern British Columbia this winter. The incentives: recent prolific discoveries, a new big-inch pipeline, and increased work requirements. . . . p. 30

•

The search for a more versatile diesel fuel continues at Southwest Research Institute. Scientists are looking for fuel that would permit adequate wartime supplies for both industrial and military needs. . . . p. 78

•

More than 25 wildcats are expected to be drilled in Australia next year. That's the "low" estimate of an oil official from the state of Queensland, on tour of the U.S. . . . p. 89

•

A high-strength steel alloy is said to "substantially" cut costs of building tanks for liquefied gases. Use of 9%-nickel steel eliminates several costly fabrication steps. . . . p. 102

Up to the Minute / SIGNIFICANT LATE NEWS

Kennedy: No Mandate, No Whip

The hairsbreadth Democratic presidential victory lessens some potential threats to the petroleum industry.

President-elect John F. Kennedy barely squeaked into the White House. Any personal "mandate" was clearly missing. Thus Kennedy's strength and the prospect of sweeping policy changes are proportionately reduced.

•

The power of the Democratic Congress continues strong. Kennedy must seek cooperation and forget any whip-cracking. The moderate tenor of Congress has undergone little change. Votes on oil and gas depletion, for example, are still expected to be favorable to the industry. Congress' position on oil imports is not apt to be changed substantially. Congress will go along with many Kennedy proposals, but will not be dictated to.

•

Lyndon B. Johnson emerges from the election with increased prestige. Although a Vice-President can only be as powerful as his President allows him to be, Johnson is in a good bargaining position. He helped return Texas and some southern states to the Democratic fold and did not frighten off northern and eastern votes. Kennedy will need Johnson for liaison.

Johnson's majority leader job and his Senate seat from Texas must be filled.

Sen. Mike Mansfield (D., Mont.) probably can be Senate leader if he wants the job. But he may reject it because of his religion—Catholic. In that event, Sens. Mike Monroney (D., Okla.), Henry Jackson (D., Wash.) and others get into the running.

In Texas, several House members have their eyes on the Senate vacancy. Among the front-runners are Reps. James Wright and Frank Ikard, both Democrats. A lone Republican in a crowded Democratic field might have a chance for an upset, however.

•

Only a few faces will change in the House and Senate. The Republicans scored net gains in both bodies, but the Democrats maintain solid control. No committee chairmen important to oil were defeated.

Democrats will take early control of some key regulatory agencies. At the Federal Power Commission, Kennedy—if he wants to—will be able to replace Commissioner Paul Sweeney, a nominal Democrat unconfirmed by the Senate. One vacancy exists and will undoubtedly be filled by a Democrat. Kennedy can replace Commissioner Arthur Kline when his term expires in June and thus gain a 3-to-2 Democratic majority at FPC.

Kennedy favors utility-type controls by the FPC, but won't press this line. During the campaign, his natural resources policy statement advocated such control of independent producers' natural gas sales.

•

The Federal Trade Commission and Interstate Commerce Commission can be converted quickly. Two vacancies exist at ICC, and Kennedy can gain control there by naming Democrats. He will be receptive to arguments by Rep. Emanuel Celler (D., N.Y.) and others that ICC regulation of oil pipelines be tightened. At FTC, Kennedy can either replace or keep Earl Kintner, now the unconfirmed chairman, as a member of the Commission. By replacing one other interim Eisenhower appointee, Edward K. Mills, Jr., he can gain political control of FTC.

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Top oil policy-makers at the Interior Dept. and OCDM will be replaced. Interior Secretary Fred Seaton and Under Secretary Elmer Bennett will go. Imports Administrator Lawrence O'Connor and Oil & Gas Office Chief Matthew V. Carson, Jr., are expected to leave. Kennedy has made no firm commitments for successors. The Office of Civil & Defense Mobilization will be cleared of Eisenhower appointees.

Kennedy won't change imports control quickly, if at all. There is no chance that the control program will be discarded. Some loosening is possible, particularly for residual fuel oil to the East Coast.

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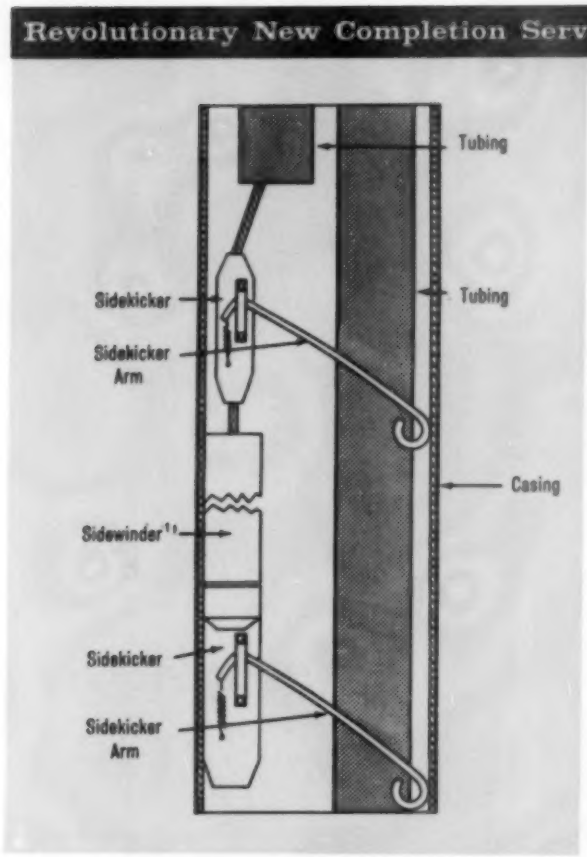
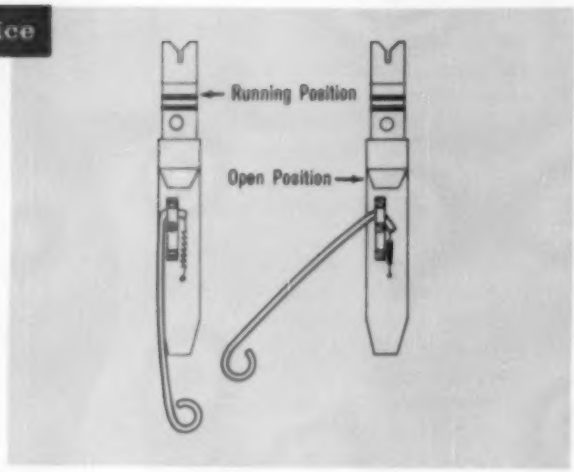
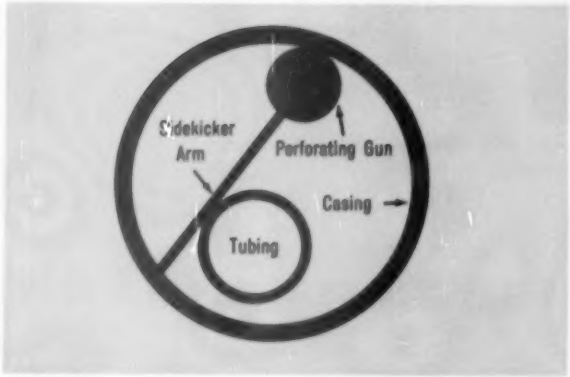
Tax outlook: Kennedy is expected to seek continuation in 1961 of the 1¢-per-gal. extra motor fuel tax added in 1959. The new Administration is pledged to study oil and gas depletion.

Revolutionary New Completion Service







Sidekicker Solves Dual PWC* Problems

*** Permanent Well Completions**

Welex engineers have answered the problem of perforating an upper zone with no risk to the adjacent tubing string in dual permanent well completions. The new development — another first by Welex — offers these advantages:

- Service can be performed through 2" tubing and standard seating nipples.
- The Sidekicker, a mechanical orienting decentralizer developed by Welex, forces the Sidewinder[1] perforating gun against the side of the casing, assuring maximum penetration.
- The Sidekicker positions jet gun so that the charges will fire outward through the casing — never in the direction of the adjacent tubing string.
- Sidewinder[1] retrievable carrier absorbs the shock of detonation, protecting adjacent tubing string from damage.
- Absolutely no debris is left in the hole. All debris is retained in the carrier and returned to the surface.

Welex, the company that originated jet perforating proudly adds this new service to the other "firsts" that it has introduced to the oil industry.

In Permanent Well Completions, as well as in other types of completions, Welex has a complete set of tools for every job. Next time and every time let Welex's completion services work for you.

W E L E X , I N C .

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General Offices: 1400 East Berry, Fort Worth, Texas
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THE EYES OF THE OIL INDUSTRY

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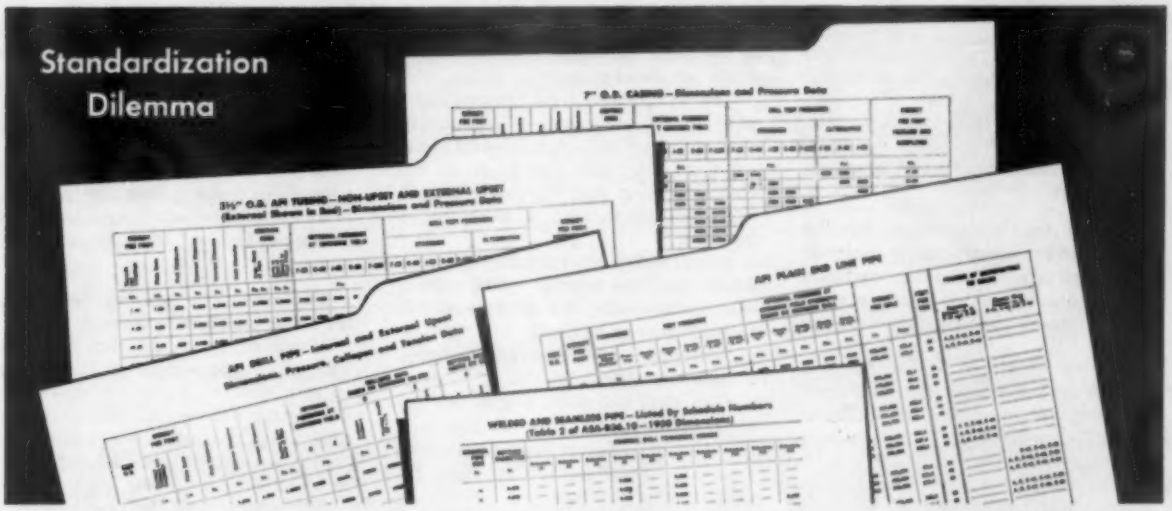


Are Equipment Specialties Becoming Too Diverse for Comfort?

The feeling is growing among many oil men that the petroleum industry may be paying an unnecessarily high price for its technological progress and manufacturing competition.

It is making some people wonder whether the industry's standardization program—which has meant so much through the years—is being defeated by innovation and extremes.

No one pretends that the current situation is comparable, in any way, to the chaos of the '20s and early '30s—the chaos that led to standardization of equipment.

But the general picture now is causing many cost-conscious members of the industry—manufacturer-suppliers and users alike—to become increasingly concerned.

The basic question is this: Is the volume of nonstandard specialty items getting out of hand? Or are too many standards obsolete or inadequate for the times?

There are, for example, several hundred different size-weight-thread-strength combinations of pipe, particularly tubing. There are hundreds of different bit combinations, hundreds more valve combinations, dozens of variations in tool joints.

Just how many are more-or-less standard, and how many are in the "specialty" category—modifications or complete departures from standard, made up to individual order or offered as additional "lines"—is difficult to determine.

The significant aspect is that the volume of specialty items seems to be increasing daily.

"I used to know our stock very well," says the representative of one large tubular goods manufacturer. "Now I have to check the catalog every time. It's pitiful the extra expense this is causing. And it is very difficult for us to keep up the kind of inventory our customers want."

"The industry can't possibly understand how much this sort of thing is costing it, or it would be making some very fast tracks back toward standardization," observes an engineer for a major oil company.

Those expressing concern about the situation point to "silly" variations in sizes and types.

"We make a standard-sized tool joint," notes the production manager for one manufacturer-supplier. "Frequently, a customer wants it an inch, or two inches, or three inches longer. We don't feel that the extra length helps a bit, but we don't argue. If we did, he'd go somewhere else."

In other instances, customers may want from one to three bands of hard facing on tool joints. Still others may want special shaping of the shoulder.

Or, on drill bits, customer preferences may require variances of only fractions of an inch in jet nozzles.

In some areas, operations are geared to 30-ft. sucker rods—in others, 25-ft. rods. "Exactly what difference it is supposed to make is a mystery to me," observes one manufacturer.

For a hole drilled to take the same size casing, the favored bit diameter may vary by not more than a quarter of an inch. But that's enough to compel a manufacturer to put out a complete line of bits in three or more sizes when one probably could be used for all.

"Sometimes it looks as though every engineer has his own idea of how to complete a well," says one manufacturing official. "It's got so that our Christmas trees are practically hand-made, at least those for multiple completions.

"Every company wants to hang its tubing differently. That means you can't standardize on the centers or the flanges."

These variances raise production costs for the manufacturer and, inevitably, for the purchaser.

In the first place, the manufacturer cannot take advantage of long production runs. Instead, he must have the order in hand first, then make a short run on a more costly unit basis.

But the problem is more extensive than this. Considerable engineering and tool-up time and expense must precede production of a specialty item.

And inventory headaches are multi-

"Taking in all phases of standardization, the spending of the petroleum industry adds up to an annual gross figure of $9.4-million, a very substantial sum."

A. P. Frame, senior vice-president, Cities Service Co.

plied many-fold. The manufacturer must be able to supply this particular customer's needs, while other customers may want their variations, too.

He thus winds up with an extraordinarily complicated—and expensive—inventory.

One of the basic causes for the hodge-podge conditions is natural: The industry is evolutionary, and certain advances, such as multiple completion, require unconventional equipment.

This one development, for instance, brought on something of a revolution in tubing and coupling sizes, wellhead assemblies, packers, and similar pieces of equipment.

"The trouble is, the development mushroomed so fast that any effort to standardize couldn't keep pace," explains one manufacturer.

In time, some of the variations will become standardized, and others will die out, or stay around as nonstandard items.

All this takes a long time, however—and new products constantly coming along confuse the whole picture.

The big impetus is a double-pronged pressure condition. On one hand, "hungry" manufacturers and suppliers are trying to increase their sales volume by introducing new products.

When business is good, manufacturers are not too eager to make nonstandard variations. But during a period like the present, when competition is very tough, attitudes change quickly.

As one tubular goods representative describes it:

"Mills which normally are tough toward customers change right around. All the customer has to do is name it. They may cuss about its being nonstandard, but they'll turn it out."

Another supplier-manufacturer notes: "Manufacturers bring it on themselves. They are trying to come up with something better than their competitors."

On the other hand—and this is a motivating force that draws much fire—specialty product pressures are fanned by "the whims of many oil companies."

Frequently, the manufacturer-supplier is pushed by an oil company executive to design and produce a new or modified piece of equipment to meet conditions in a limited area, or to carry forward some new technique or development.

"Every engineer with every oil company wants to be a hero and invent something of his own," snorts one supplier. "He sells somebody in the company on it, and the company sells somebody on making it according to his ideas."

Even though the manufacturer may doubt that the change is warranted, he usually makes it rather than risk possible loss of business.

Sometimes, variation demands approach the ridiculous.

One steel company official, for instance, recalls that an oil company asked for a 12-degree bevel on a casing coupling instead of the standard 20-degree bevel.

A checkback disclosed that an engineer had arbitrarily selected the 12-degree requirement, without thinking that retooling would be necessary.

One Project Alone To Save $115,000

If API's board approves in Chicago next week, $48,000 will be tagged for a 1961 research program on tensile-strength properties of casing joints.

A new standardization formula—and considerable savings—could result for users of oil field equipment. It has been estimated, for example, that a 10% upgrading of joint strength on 7-in. casing could save the industry as much as $115,000 a year.

The formula used currently to calculate joint tensile strengths was established in 1940. For some time there have been indications that a more liberal formula is justified.

If it is revised, operators will be able to use lighter casing for many applications, reducing considerably the cost of thousands of tons of steel buried annually by the industry.

The proposed program would involve 162 pull-out tests on 54 combinations of OD, grade, wall thickness, and thread length. It has been approved by API's Production division.

In another instance, a production superintendent for a major company demanded closer tolerances in downhole pumping equipment than standard API requirements.

"For a long time, we were foolish enough to make a specialty item for him at a standard price—until we finally woke up," the manufacturer says.

This feature is causing headaches for some purchasing agents, also.

Major company supplies of items such as pipe seemingly are low enough now to warrant a step-up in purchasing. However, some companies have a considerable amount of "cat and dog" inventories—odd sizes and specifications—still lying around.

Yet, under present inventory policies, the agents must find ways to get rid of these stocks before making new purchases.

Because of this "whim" factor, manufacturers and standardization advocates view current decentralization trends with misgivings.

Decentralization gives a greater degree of authority to the lower echelons. The danger, insofar as standardization is concerned, is that the local manager may solve his particular problem by using unconventional equipment—but the solution may not apply elsewhere.

Yet the industry as a whole will have to bear the cost if the nonstandard items reach any volume.

False economy is a factor too.

"The top echelons of major companies are sympathetic to manufacturing problems," says one big supplier.

"Innumerable edicts have been sent to the field explaining how to make the best buy possible. But the policy breaks down when the district engineer interprets 'the best buy' to mean the 'lowest price'.

"It is unfortunate, but many young engineers at the district level are prone to overstress the idea of saving money by insisting on minimal requirements in oilfield equipment.

"Take pumping units as an example. It may be that an engineer determines 50 in. to be ideal for his lifting requirements in a particular field. But rather than underrate or overrate units having standard strokes (54 in. and 48 in.) he will special-order a unit having the precise characteristics which his slide rule dictates."

While there is general agreement on the existence of the problem, the reasons for it, and the desirability of solving it, a solution appears almost hopeless to most of those concerned.

"As long as my competitor is willing to do business that way, so am I," says one. And another adds:

"As long as people are competitive and desperate to do business, I don't know how to eliminate these conditions."

"Each [oil] company thinks it can do the same thing better and faster than anybody," says a third. "We may feel, with plenty of reason, that all could do it the same way without losing a thing. But what can we do about it?"

Here and there, some resistance—born of economic necessity—is beginning to show up.

One major oil company is considering the possibility of going to special-sized downhole equipment so that it can cut the size of above-surface equipment. But its manufacturers foresee a sizeable investment in plant retooling, and are trying to show the company that the prospective savings aren't worth a major changeover.

By and large, however, the "you name it, I'll build it" attitude prevails, regardless of costs.

Normal standardization procedures admittedly are not designed to overhaul established requirements swiftly. They are planned to "follow, not lead" developments.

"If we operate in any other fashion, we would not be able to take advantage of experience," explains one standardization expert. "We might standardize on something that actually might become obsolete rapidly because of a new development.

"We must go slowly enough to make sure that the standardization action is valid and has taken into consideration all the elements involved and all the possible alternatives."

Besides, he points out, the industry is infinitely more complicated today than it was 35 years ago, when the first standardization was undertaken. It is necessary to contend with such a multiplicity of problems that quick action might create a stickier situation than the one it was intended to solve.

What Can API Do About the Growing Problem?

Sources close to the problem feel API can—and should—do something. These sources believe that API must step up its standardization efforts, and try to avoid delays or tendencies to get embroiled in inconsequential projects.

"What many people keep forgetting, however," one official remarks, "is that API is nothing more nor less than the industry itself. The people who say 'API should do this or that' are the people who comprise API.

"They or their representatives make up its committees, and control the organization. If they feel API should take certain action, it is up to these people to get together and see that it is done."

It has been suggested that a general overhaul of industry standards is needed urgently, and that some kind of a special task force should be set up to expedite the job, and reduce conflict.

"It should be an impartial, objective study aimed directly at the simple target of deciding just exactly what the industry needs," says one advocate.

"It should be supported jointly by the manufacturers and the operators. Both have a lot to gain.

"It should be geared to the establishment of standards that would meet conditions in each of the major producing areas in the country."

Those favoring the study feel that the many types, weights, and threads of tubular goods alone could be reduced drastically—with a tremendous saving in costs, and without affecting the industry's drilling or production abilities.

They think the same results could be attained for almost all of the equipment and materials involved. But they stress that the study would have to be extensive, and would have to have the wholehearted cooperation of manufacturers and users alike. And it would have to be completed within a reasonable length of time, so that the findings wouldn't be outdated.

One study advocate suggests that computers might be used to analyse problems and requirements. "I know one thing," he says. "A lot of these fancy so-called advances would show up as unnecessary and too expensive in the light of what is actually needed."

It could mean, too, the establishment of some kind of industry code for the handling of nonstandard items.

Once basic standards were overhauled, this step would be a necessary requisite to prevent recurrence of the present situation, proponents say. The code would insure premium pricing for all nonstandard items or variations, admittedly, as one manufacturer puts it, "a tough nut to crack."

Code advocates feel this would serve two useful purposes: (1) It would permit reductions in the costs of standard items; and (2) it would act as a brake on unsound equipment experimentation but would still permit flexibility in seeking new and better ways.

Stronger emphasis on marketing research is also considered desirable by study proponents. This could head off output of a new product before a cold, objective appraisal determines its market value.

There are, of course, some categories of equipment and material in which it is virtually impossible to achieve any real degree of standardization—particularly drilling rigs.

Some of the component parts are standardized now, but, as one manufacturer comments dryly, "Over-all, it's like trying to standardize sex."

Every purchaser has his own notions about the rig arrangement that will enable him to compete.

But, as one manufacturer points out, "every departure from standard means a tremendous amount of engineering time. And, even worse, we have to service that rig later. If there were fewer deviations from standard, we wouldn't have as big an inventory problem as we do, trying to stock parts for some of the abortions some contractors put together."

In today's depressed market, however, few—if any—rig manufacturers are believed willing to retool to meet any significant standardization program.

As the buyers' market continues . . .

Producers Pay More to Sell Crude

The business of selling crude is becoming increasingly more expensive to producers.

Many of the costs, which heretofore have been borne by purchasers, are being passed on to producers, who must pay them in order to market their oil.

These are additional costs to the producer once oil is sold. They range from relatively minor expense items, such as fees for lease title searches, up to more expensive items, such as the bookkeeping costs of division of royalty and part-interest payments and the costs of transporting crude to the purchasers' storage.

With the prolonged buyers' market for crude, purchasers have been assigning such costs to producers as one means of reducing their own overhead.

Producers have little choice but to pay such costs. And some already have found means of trimming some of the expensive items, particularly transportation costs.

With the growth in the number of wells during the present buyers' market for crude, many purchasers are reluctant to make the outlays necessary to connect pipelines to leases.

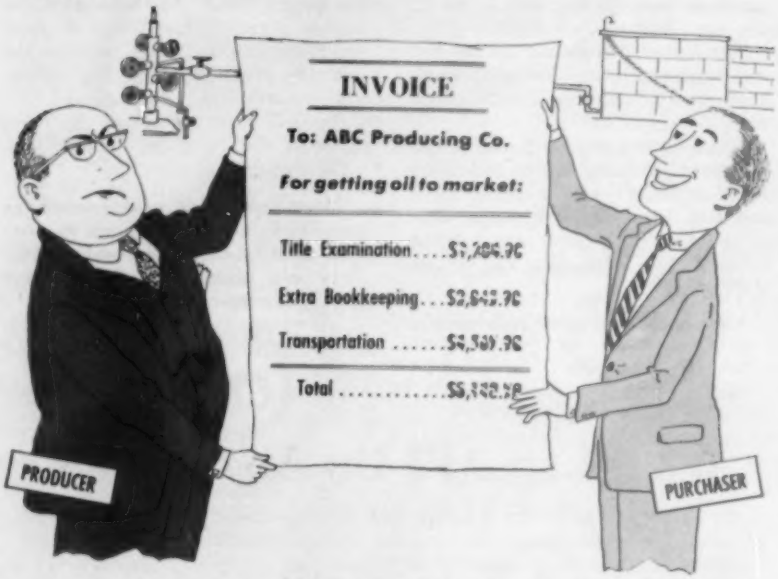
The result has been a sharp increase in the volume of crude trucked to purchasers' storage or to pipeline terminals—with the producer paying the trucking charge. Such rates normally range from around 15¢ a bbl. for short hauls to much higher figures for longer distances.

The impact of transportation costs by truck, coupled with price penalties on gravity differentials, have led some producers to build pipelines to offset some of the added selling costs they have to pay.

In one instance, the combination of trucking charges plus gravity differential penalties reduced the netback to a producer to $2.30 a bbl. for oil that carried a top posting of $3.01.

In that case, the producer had to pay for trucking his oil 4 to 5 mi. to a purchaser's pipeline. The charge initially was 15¢ a bbl. So for 41-gravity oil (posted at $3.01) the producer received $2.86 a bbl. But the posting carried a 2¢-per-degree gravity differential above and below 41-gravity. A good part of the producer's oil varied between 58- and 64-gravity, which meant that the netback on 64-gravity was only $2.40 a bbl.

But the trucking charge eventually went to 25¢ a bbl., reducing the netback on 64-gravity oil to $2.30. Too, there was an additional penalty imposed upon the producer by the trucking firm for shrinkage.



One pipeline built to connect several producers' leases to a purchaser's facilities is bringing savings in transportation costs as high as 23¢ a bbl.

The pipeline has a maximum transportation charge of 10¢ a bbl., compared with the minimum of 15¢ a bbl. the operators had been paying for moving oil by truck. The pipeline collects a gathering fee of 5¢ a bbl. from the purchaser (compared to 10¢ a bbl. that the purchaser had paid to the trucker) giving the line a gross of 15¢ a bbl.

The pipeline is operated as a closed system. Producers are paid for the exact gravity and exact volume gathered.

That eliminates the shrinkage penalty and the extra gravity penalties that the producers had been paying when their trucked crude consisted of mixed gravities.

Estimates are that, by switching to a joint pipeline, the producers are saving at least 10¢ a bbl. on gravity, 5¢ a bbl. on transportation, and 8¢ a bbl. on shrinkage.

More Companies Report 1960 Earnings

(in thousands of dollars)

	Third Quarter Net Income	% Change 1960-1959	Nine Months Net Income	% Change 1960-1959
Ambassador	$ 270	+ 36.4	$ 964	+156.0
Amerada	5,959	+ 1.0	18,018	+ 2.6
Anderson-Prichard	1,697	— 6.9	3,863	— 20.6
California Standard	.....	.....	199,255	+ 10.6
Cities Service	7,866	— 6.3	26,538	— 2.8
Colorado Oil & Gas	952	+ 30.1	638	+ 63.9
Kentucky Standard	.....	.....	10,448	+ 6.6
Kerr-McGee	4,011	+174.0	.....	.....
Ohio Standard	6,618	+ 41.7	17,574	+ 20.8
Pure	.....	.....	20,213	+ 5.0
Richfield	.....	.....	20,776	+ 14.2
Signal	4,356	+ 12.7	11,960	— 4.5
Skelly	6,033	+ 17.1	17,122	— 10.4
Texas Eastern	7,180	+ 8.3	.....	.....

U.S. to earth scientists:

Help Detect Nuclear Explosions

Oil's earth scientists, at two industry meetings, were asked to help the federal government perfect a better method of detecting underground nuclear explosions.

The request was made by Charles C. Bates, program manager for "Vela-Uniform" in the Nuclear Test Detection Office, Advanced Research Projects Agency.

Bates addressed last week's joint meeting of the American Assn. of Petroleum Geologists and the Society of Economic Paleontologists & Mineralogists in Los Angeles, and this week's meeting of the Society of Exploration Geophysicists in Galveston.

The oil industry was described as a major, untapped source of ideas.

"Oil companies have a lot of capabilities," Bates said. "If we tell them what the problem is, we hope they can help us out."

The government scientist noted that underground explosions are easy to detect, but are hard to identify.

Two helpful proposals already have been advanced by major oil companies, Bates said. One involves possible use of seismometers in wells; the other, advanced laboratory work on models and ideas used by theoretical seismologists.

Space exploration came up for discussion, too. Allen J. McMahon, of Space Technology Laboratories, Inc., told the Galveston meeting that there are many sound and practical reasons to extend the use of satellites to improve methods of meteorology, communications, and navigation.

"Exploration of lunar and planetary surfaces," he added, "may increase knowledge of the theory of the formation of primeval terrestrial hydrocarbons."

"International political considerations—although heretofore not a major factor in world exploration—are becoming increasingly so," George C. McGhee, head of McGhee Production Co., told the SEG meeting.

He listed the factors as (1) an upsurge of nationalism, (2) the demand for economic progress, (3) the trend toward government control, (4) the Russian drive for world domination, (5) neutralism, and (6) the emancipation of smaller countries.

"The short-range impact" of those factors, he said, "will probably be to continue and even accentuate the current decline in exploration activity on the part of both the international companies and geophysical contractors.

"The long-range effect, however, may well be for increased exploration activity, particularly as a result of the increased and more widely diffused demand for oil that should accompany economic development."

J. P. WOODS, director of Atlantic Refining Co.'s geophysical laboratory in Dallas, is the new president of the Society of Exploration Geophysicists.

The outgoing president of SEG, Tom O. Hall, criticized top management for "discouraging" the continuation of geophysical development.

Such a policy, he declared, has been made in the face of the "dire" need for greatly increased petroleum reserves during the next ten years.

Hall conceded that "under present market conditions, the geophysical costs for finding oil in the U.S. are too high." But, he added:

"Now is the time when we need top-flight men to carry on the development work which is so vitally needed. We certainly need all the experienced men we now have. . . We also need bright young men with new ideas."

Geophysicists, as a professional group, have made "some severe mistakes" through the years, said H. M. Thralls, a founder of Geo Prospectors, Inc., and Thralls, Green & Perry.

"Otherwise," he said, "we would occupy a much stronger position in the economic world than we do today."

Errors, he went on, can be broken down into four main divisions—economics of instrumentation, economics of field application, instrumentation, and salesmanship.

NEXT WEEK

Be Sure to Read:

Another Rise for **CAPITAL EXPENDITURES . . .**

The petroleum industry's capital outlays for new plant and equipment will be up sharply next year, on top of a high spending year in 1960.

Special Report: **OIL'S MOST POWERFUL EXECUTIVES**

Some you know, some you don't. A fast but penetrating look at the chief executive officers of the top 25 companies—how they got started, the road they followed to the top, and the turning points in their careers.

REFINERY SAFETY: An Ounce of Prevention . . .

Processors are being warned that detonations can occur in any plant unless sound fire protection programs are undertaken.

Total Demand No Yardstick for Crude

The increase in total demand for petroleum may be a faulty yardstick for measuring what the demand for crude will be.

This is the conclusion reached in a new report—an analysis of the demand for crude—prepared by the Supply & Demand Committee of the Independent Petroleum Assn. of America.

It's not likely that demand for crude will increase in volume as fast as total demand—at least over the next few years.

As it looks now, the increase in demand for crude will be only two-thirds, at most, of the total demand for petroleum.

While it may be expected that total demand for all oils may increase from 250,000 b/d to 300,000 b/d each year for the next few years, according to IPAA estimates, it's likely that demand for crude will show increases of only 150,000 b/d to 200,000 b/d per year.

Proof is that crude demand as a part of total demand has been losing ground for years.

The IPAA study, which relates demand for crude to total demand over a period of 38 years, shows that the proportion of crude to total petroleum demand has fallen off from almost 95% in 1948 to a level of 82% in 1960.

In 1937, this ratio was as high as 96%, and in 1925 had been 100%.

While total demand has increased 2.4% annually over the past five years, demand for crude has scored an increase of only 1.5%.

Total crude demand was met in 1956 by producing domestic crude at the rate of 7,151,000 b/d and importing crude at the rate of 934,000 b/d. There was no significant change in crude stocks.

But in 1959, crude stocks declined, and total demand was met by 7,054,000 b/d of domestic production, 965,000 b/d of crude imports, and 15,000 b/d from inventories.

Domestic crude production has sagged substantially during the same period. In 1959, U.S. crude production was 97,000 b/d less than in 1956.

Oil Supply & Demand — 1959 vs 1956

(thousands of b/d)

	1956	1959	Change
Domestic demand	8,779	9,422	+643
Exports of refined products	351	233	−118
Total Demand	**9,130**	**9,655**	**+525**
Change in product stocks	**+179**	**+66**	**−113**
Total required supply	**9,309**	**9,721**	**+412**
NGL production	801	879	+ 78
Residual fuel imports	445	612	+167
Other product imports	57	203	+146
Subtotal	1,303	1,694	+391
Domestic crude required	8,006	8,027	+ 21
Crude exports	78	7	− 71
Total crude demand	**8,084**	**8,034**	**− 50**
Change in crude stocks	**+1**	**−15**	**− 16**
Domestic crude production	7,151	7,054	− 97
Crude imports	934	965	+ 31

Stress Need for Gas Legislation

Natural gas and oil imports—and the urgent need for legislation in both fields—dominated last week's annual meeting of the West Central Texas Oil & Gas Assn. in Abilene.

Among those who hammered away at the two subjects were Elmer F. Bennett, Under Secretary of the Interior, Alvin C. Hope, president of the Independent Petroleum Assn. of America, and Sam Robertson, president of the host organization.

One speaker stressed that a gas supply crisis is in the making, and could become acute during the next decade.

Hope, of IPAA, warned that discovery of new gas reserves is trailing, and that legislation to free producers from utility-type controls is imperative if a supply crisis is to be averted.

In 1946, he pointed out, the industry had a 34-year reserve supply at the demand rate then in effect. Mushrooming demand has reduced this ratio to less than 21 years now, and forecasts indicate that there will be a 50% expansion in demand and distribution during the 1960's, he said.

"I accept this forecast, but I wish to ask a cautious question," Hope said. "Where is the gas to come from and still have the required years of reserves?"

The IPAA president said the industry, if the present growth trend continues, will soon be below the 20-year supply standard required by the Federal Power Commission.

Another speaker urged that an immediate study be made to determine if "below-cost" sales of natural gas were having an "adverse impact on producers' prices."

This suggestion came from Under Secretary Bennett, who said: "It seems to me there are conservation factors involved in our limited gas reserves which are not receiving sufficient attention."

Robertson, in his address, urged that import controls be made a matter of law. This, he said, "would relieve operators of wondering and waiting for new quotas to be assigned every six months."

PETROLEUM WEEK

Will Provide Center Of API Information

Petroleum Week's Registration Directory Board will supply up-to-the-minute information on all registrants at next week's API annual meeting in Chicago.

The board will be located on the mezzanine floor of the Conrad Hilton Hotel. It will show each registrant's name, company affiliation, and hotel room number.

Information on people attending the meeting can be had by calling the Conrad Hilton operator and asking for API Information Directory.

92%

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On your next well, reduce hole time, speed up drilling, stabilize the hole, and reduce wear and tear on drilling equipment. You'll be in good company, too, right along with the 92 per cent of the world's oil companies who use Magcobar now. And you'll be helping yourself with the better-engineered mud products of Magcobar.

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What's New / IN THE INDUSTRY

Twelve gas pipeline companies, including two interstate lines, are studying the possibility of tapping gas reserves in 14 West Central Texas counties. It's part of a drive by producers in the area to improve markets for their increasing uncommitted reserves. The special gas committee of the West Central Texas Oil & Gas Assn., in a new report, said the two interstate carriers were ready to enter the area "as soon as enough uncommitted operators join together through the association to provide proven reserves of approximately 750-billion cu. ft." The committee says it has now lined up reserves of 492.7-billion cu. ft. from 43 operators, and it has set a Nov. 17 meeting to try and get more reserves committed.

The committee says the 492.7-billion cu. ft. of reserves now available for market include 89 shut-in wells on 71,266 proven acres still open for the drilling of 209 development wells. In addition, the operators hold 284,441 acres of wildcat leases with gas possibilities, on which 233 tests might be drilled if markets were available.

•

The increase in turnkey-type contracts may help lift drilling out of its doldrums. That's what W. L. McClusky, outgoing president of the American Assn. of Oilwell Drilling Contractors, told members of the Petroleum Engineer's Club in Dallas last week. McClusky said the turnkey or semi-turnkey work agreement has gained momentum in the past few years, and added that, if it keeps up, technical personnel such as engineers and geologists may some day be on the contractor's payroll instead of the producer's. However, he was quick to point out that, if turnkey work becomes the rule rather than the exception, the small contractor will have a difficult time in surviving, due to working capital needs and increased overhead in supporting technical personnel.

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Cities Service Co. plans to consolidate the operations of its domestic oil exploration, production, and related activities in the near future. The company anticipates that the consolidation will occur shortly after it acquires the outstanding stock of Arkansas Fuel Oil Corp., now expected in early December. The program will bring the exploration and production activities under Cities Service Oil Co. (Del.), its principal operating subsidiary, with headquarters in Bartlesville, Okla. Robert L. Kidd, now president of the latter company, will become chairman of the board and will continue as chief executive officer. J. E. Heston, who has been president of Arkansas Fuel since 1956, will continue in that post and will become president of Cities Service Oil (Del.). Marketing is not involved at this time.

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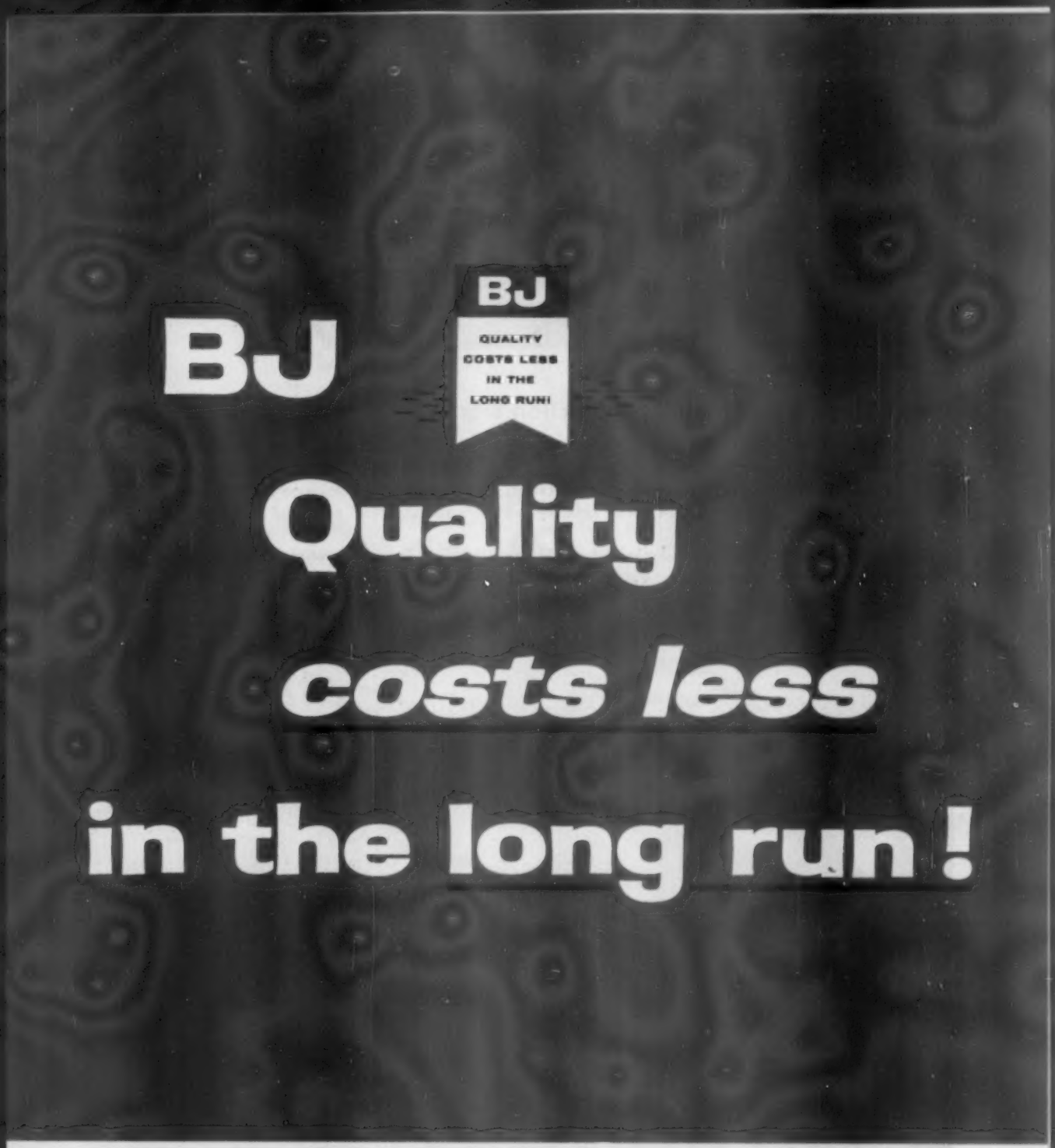
A natural-gas fuel cell is under development at the Institute of Gas Technology, an affiliate of the Illinois Institute of Technology. The fuel-cell power pack will generate electricity directly from natural gas, water, and air. Research on the project is being sponsored by the American Gas Assn. "Development of natural-gas fuel cells is now in the laboratory stage," says Dr. M. A. Elliott, director, "but progress is encouraging, and construction of prototype fuel-cell batteries will begin in 1961." He added that a natural-gas fuel cell power pack producing about 10 kw. probably will be no larger than a gas furnace.

•

Houdry Process Corp. and Commonwealth Oil Refining Co. have settled a suit involving the latter's Ponce (Puerto Rico) refinery. The suit, which had been pending for more than two years, was settled "amicably," the companies announced this week.



"Cut-rate" merchandise is seldom a bargain. This is especially true of oil tools where a small saving in initial investment is often purchased at the price of dependability, safety and long-range economy. The true measure of a tool's value is found, not in its first cost, but in its useful working life—in its total productivity, year after year.

Byron Jackson oil tools cost a little more and are worth it.

Proof that BJ quality costs less in the long run is this: more BJ tools are seen on rigs the world over than any other make. Users know that our 88-year reputation for quality stands behind every Byron Jackson product. These products are sold through leading supply stores everywhere and are backed by our own field staff of trained personnel—paid by BJ to do right by the customer.

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CENTRIFUGAL COMPRESSORS

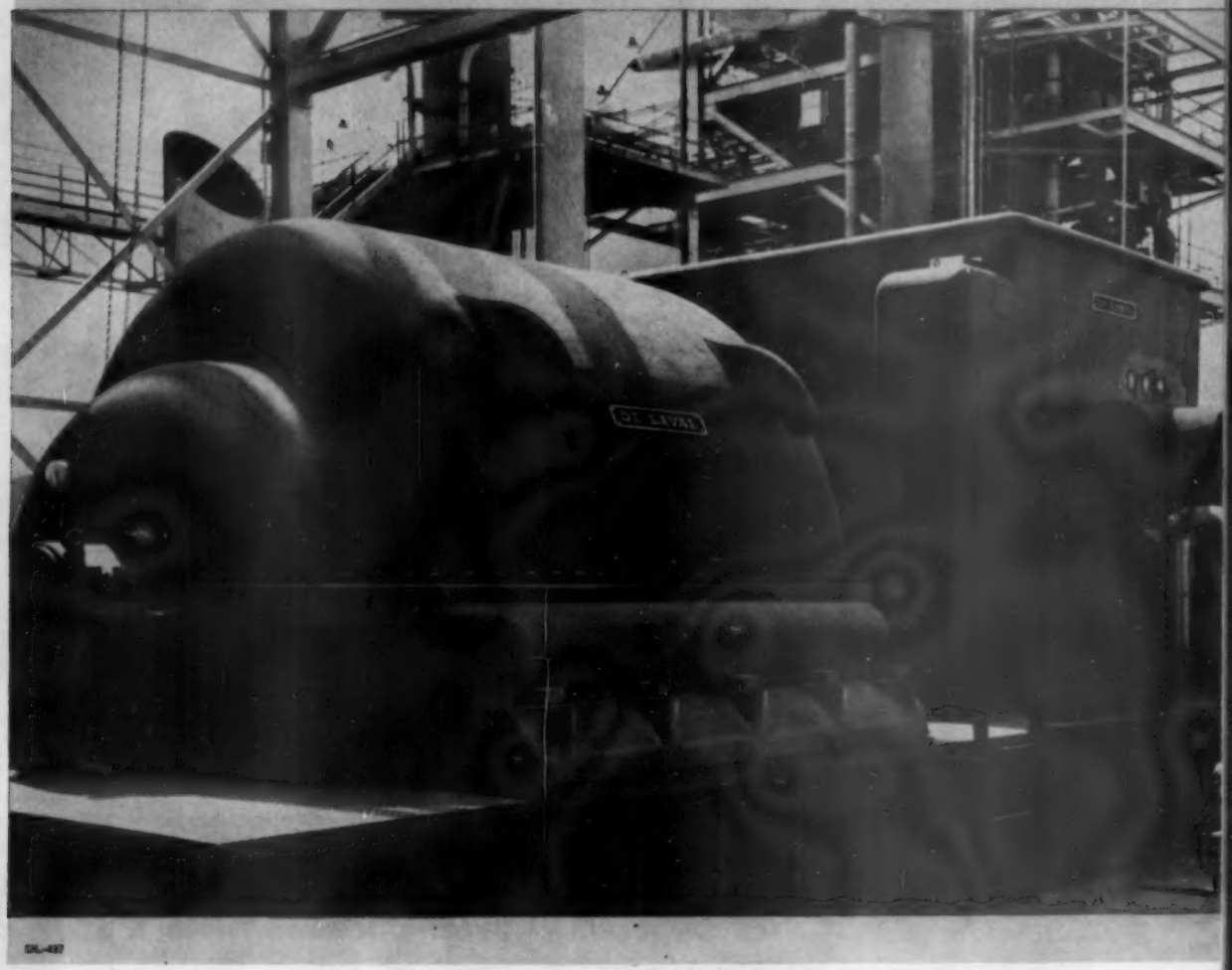
11,300

Driven by automatic extraction steam turbine

Shown below is the large 11,300 horsepower centrifugal blower which compresses air for the main blower service in catalyst regeneration at Standard Oil of Ohio's new refinery at Toledo, Ohio.

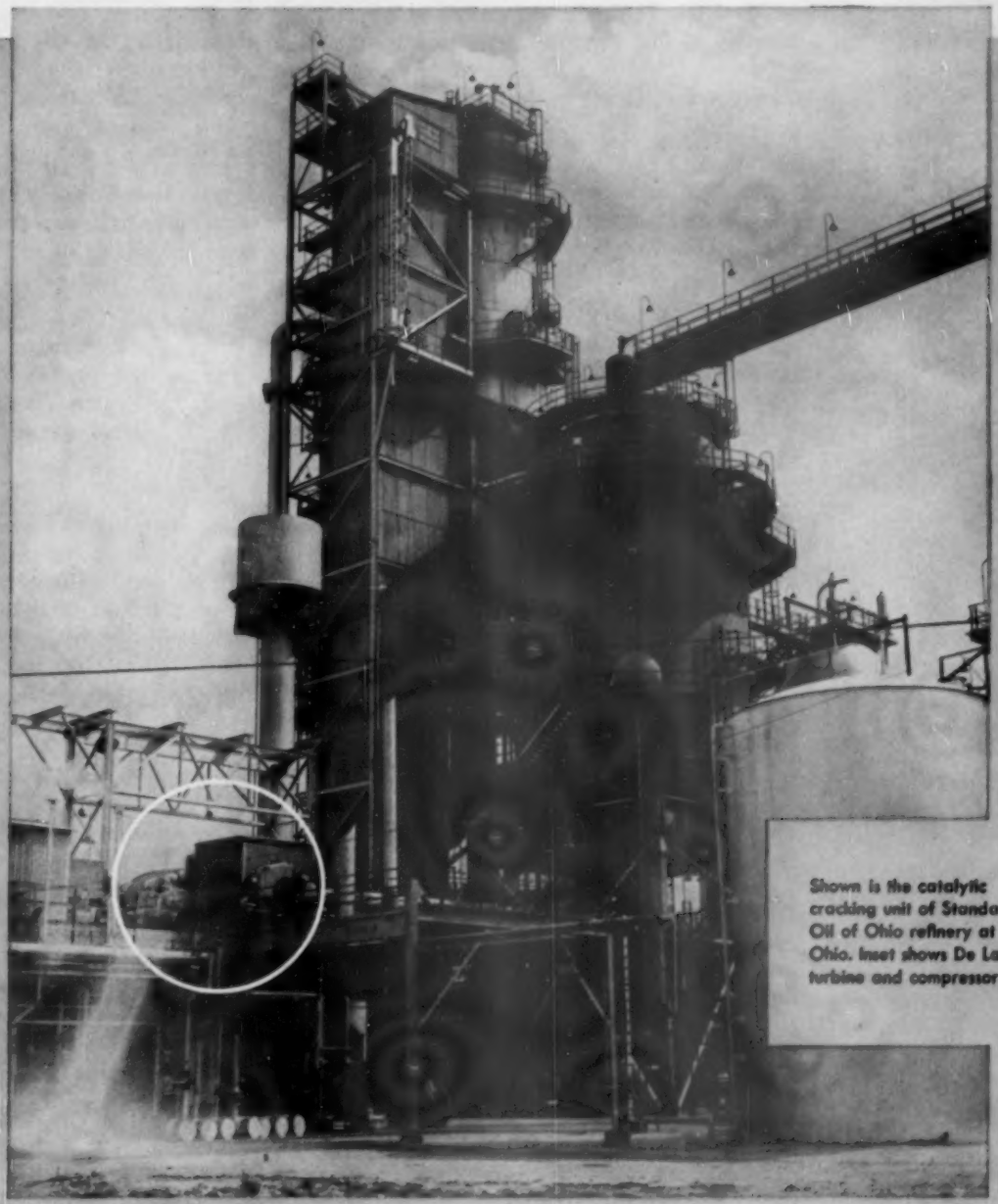
Driven by a De Laval single automatic extraction steam turbine, it compresses 110,300 cfm in four stages at 2800 rpm. Inlet pressure is 14.7 psia and discharge pressure is 40.7 psia. The turbine is designed for 600 psig ISP, 740F extracting at 55 psig, and exhausting to 23" Hg.

This is another example of De Laval proved performance.



DL-497

horsepower DE LAVAL compressor for "cat cracker" at SOHIO refinery



Shown is the catalytic cracking unit of Standard Oil of Ohio refinery at Toledo, Ohio. Inset shows De Laval turbine and compressor unit.

DE LAVAL *Steam Turbine Company*

897 NOTTINGHAM WAY, TRENTON 2, N. J.

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
November 11, 1960

Imports of residual fuel oil continue to be one of Washington's stickiest problems. On residual policies, there are about as many hidden conflicts within the government as there are open ones in the oil industry.

The military is concerned with the higher prices it is paying for residual oil. The main complaint is too few bidders for supply contracts, because of the limited number of residual importers under the control program. There is a belief that the result is higher bid quotations and, consequently, larger government expenditures for purchasing fuel oil.

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The State Dept. still wants higher residual import levels, mainly to help strengthen ties with shaky Venezuela. The diplomatic requests for special consideration for the Latin country appear to be making no headway, however.

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On another front, some oil jobbers may go to court in protest against residual allocations. The Interior Dept. proposal to increase the number of residual importers by adding certain terminal operators has drawn jobber wrath. Some companies are considering a court fight if the plan is adopted.

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Meanwhile, the Office of Civil & Defense Mobilization has two surveys of residual price and supply in the works. One is a study being conducted for OCDM by the Federal Reserve Bank of Boston. Preliminary results show "no general trend" of residual price increases in New England since imposition of mandatory controls. Further findings by the bank are expected before the end of the year. The second is OCDM's own check, requiring reports on a monthly basis from about 60 companies.

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Note these dates for residual reports to OCDM.

Nov. 22—The first price and delivery report on residual, covering the first ten months of 1960, is due at OCDM on this date. Each month will be reported on separately, not lumped together. The reports involve only full tanker cargo deliveries.

Dec. 22—Reports for the month of November are due.

Dec. 30—Back reports, covering 1957 and 1958 by months, should be in by this date.

Jan. 23 is the deadline for the December monthly report, and **Feb. 23** the final date for the January figures.

•

Federal Power Commission members are in disagreement over applying area gas prices to pipeline-producers. Chairman Jerome Kuykendall has already publicly stated his preference for this plan. But at least one other member is strongly opposed. The disagreement may delay decision on a pending Panhandle Eastern Pipe Line Co. case, where a policy ruling is expected.

Number 1 of a Series

TELL THIS PETROLEUM INDUSTRY FACT TO YOUR NEIGHBOR

Don't eat the seed corn!

From each year's harvest, a portion must be set aside as seed corn to assure a crop next year. Never sold, never eaten, the seed is the only guarantee against a famine.

The same is true with oil and gas. A new "crop" must be *sought* each year. Percentage depletion, commonly but erroneously called "depletion allowance," provides the seed that finances the search and assures next year's crop of oil. A substantial portion of each year's income must be set aside by the petroleum industry, as seed, to guarantee a continuing supply of oil and gas. This operating principle has made the petroleum industry a leader in free world enterprise.

A nation deprives itself of its own future and penalizes all consumers when it deprives any industry of the seed that guarantees future productive harvests.

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Big Gas Hunt Set to Go on Freeze-Up

A doubling of activity seems to be in the works this winter for the mushrooming gas province in the "Ft. Nelson square" of northeastern British Columbia.

The frigid blasts and plunging temperatures of November are signals for the start of drilling preparations in this vast, muskeg-ridden area, an 80-mi.-square wilderness that has become one of Canada's hottest exploratory regions (PW—Apr.8'60,p39).

John W. Buckley, president of Canada Southern Petroleum, Ltd., holder of substantial interests in the region, said recently:

"Based on new discoveries and extensions of previous ones, that portion of Western Canada from the Ft. Nelson area in northeastern British Columbia northward into the Northwest Territories now appears to be one of the most prolific gas provinces in the Western Hemisphere, as to both actuality and promise."

There are three major incentives for the doubled pace this winter:

First, prolific discoveries of the recent past provide the impetus for participation in the continuing search for new reservoirs and the extensions of others.

Second, the new big-inch pipeline project of Westcoast Transmission Co., Ltd., has been geared to provide access to markets on a field-by-field basis as far north as Celibeta Lake in the Northwest Territories, as reserves warrant. The first stages of main-line construction are expected to start next spring (PW—Jul.22'60,p40).

The third factor in the expected boost in activity is the increased work requirements. These requirements increase each year as the permits grow older. Many permits now require work expenditures of $1 per acre per year if they are to be kept in the permit stage, which is desired by some operators in order to gain more knowledge on which to make more intelligent lease selections.

Best estimates are that from 25 to 30 holes will be drilled in the 6,400-sq. mi. area during the winter drilling season.

A PETROLEUM WEEK survey shows that several drilling programs are currently being firmed up by operators in the area.

Exact size of the programs could not be determined, however, because some operators noted that some of their planned tests hinge on the outcome of other tests in the vicinity.

Other operators also were unable to give firm totals pending results of the Nov. 24 land sale. This is so because drilling of certain holes is contingent on acquisition of the land. Pre-sale announcement of intentions could affect prices bid at the sale, too.

Virtually all drilling activity in the area is confined to the time between freeze-up and thaw. It turns cold in November, and the ground is usually considered hard enough by the first or second week of December to get winter drilling programs under way.

Several of the estimated 25 to 30 tests for this season will be carryovers from last season. And of the 12 to 15 rigs that are expected to be used in the Ft. Nelson square this winter, at least six were left in place when the break-up came last spring.

Clark Lake, Kotcho Lake, and Petitot River fields still top the list of gas discoveries in the Slave Point (Middle Devonian) reef play.

Clark Lake is 7 mi. southeast of Ft. Nelson; Petitot is approximately 70 mi. north of the town; and Kotcho Lake is 45 mi. northeast (see map).

The promising Pocket Knife area, some 80 mi. southwest of Clark Lake, also is being considered a possible Slave Point prospect, though production so far has been from the Mississippian.

It's estimated that last winter's activity added roughly 2-trillion cu. ft. of proved gas reserves in the Ft. Nelson square.

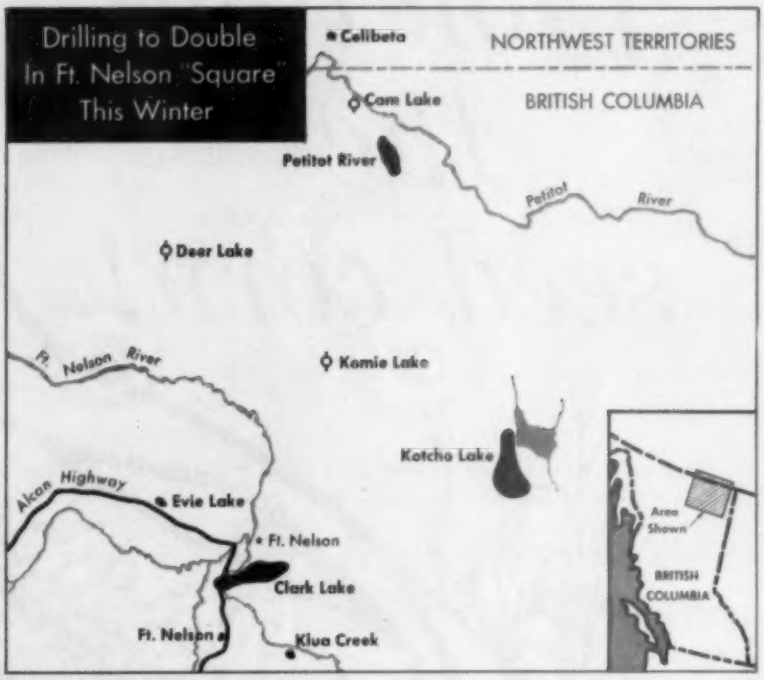
Total proved reserves in northeastern British Columbia as of Dec. 31, 1959, were estimated by the Canadian Petroleum Assn. at about 1.8-trillion cu. ft.

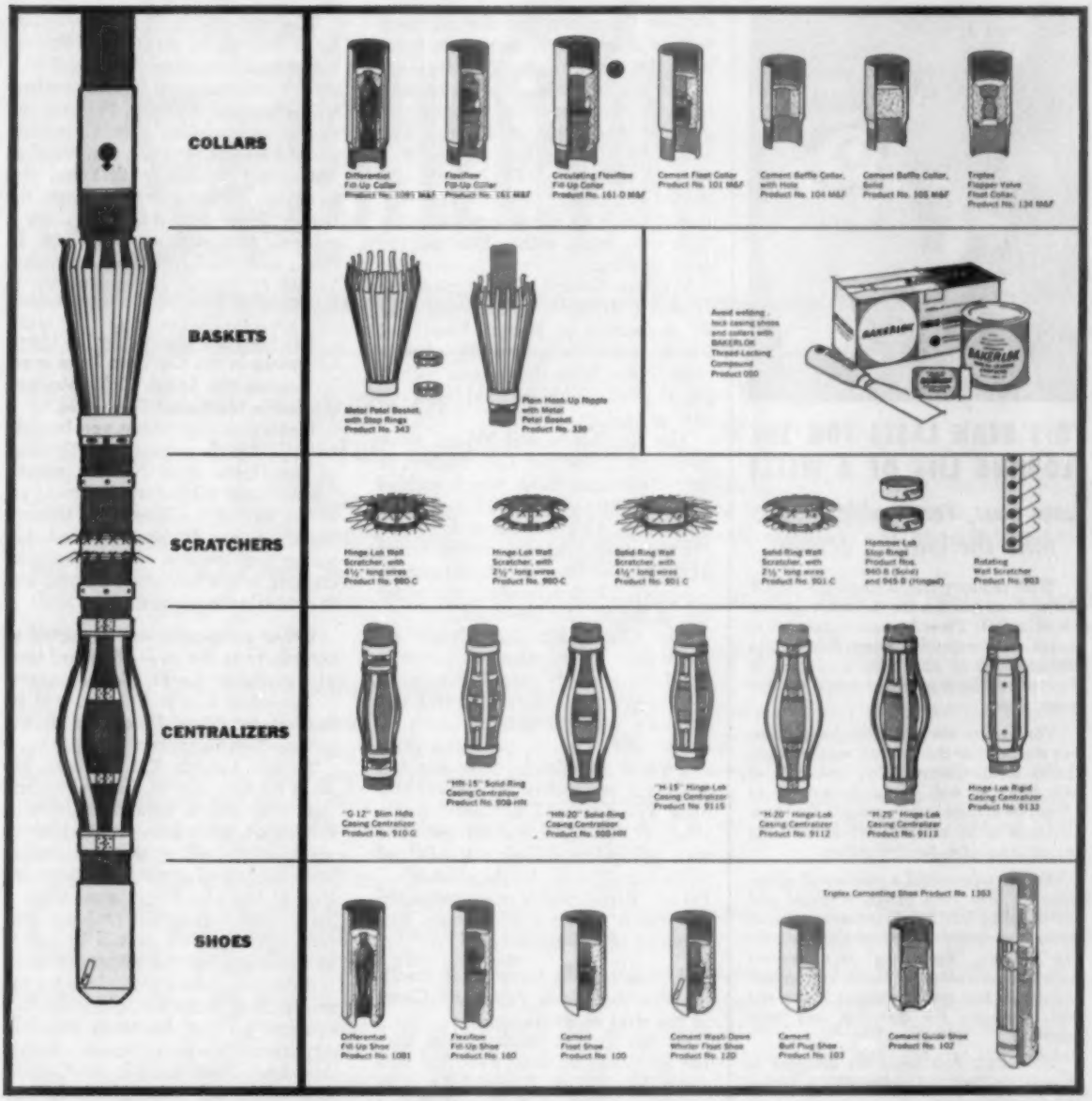
This estimate, however, did not take in later extensions at Clark Lake, nor did it include reserves being proved up at Kotcho, Petitot, and other points in the big area.

The 2-trillion estimate for Slave Point reserves added last winter is due to the fact that that amount of gas was set up as a target in order to encourage an early start on a pipeline—and the pipeline is being started.

One company—Western Natural Gas Co., Inc.—has literally "barged" into the new season without waiting for freeze-up.

Western Natural began late in October to move a rig—kept in the area through the summer—by barge across the Nelson River in the Ft. Nelson vicinity. Object is to get such a head-





Good primary cementing equipment makes sense

THERE ARE TWO WAYS to buy primary cementing equipment—by quality and by price. Both are important.

Still, some operators don't shop for quality. They feel that primary cementing is a more or less routine operation. So any shoes, collars, centralizers, scratchers, baskets are good enough.

IN OUR OPINION (and plenty of operators agree), primary cementing is never routine. You've got just one chance to get a good primary cement job. So it makes plain good sense to invest in the most advanced equipment you can get.

Any remedial operation that comes later not only comes at high extra cost—it is never as satisfactory as a primary cement job that's done right in the first place.

THE BEST OF MODERN ENGINEERING is built into Baker Primary Cementing Equipment—yet prices are competitive. Here is equipment you can depend on.

Get Baker Primary Cementing Equipment from your Supply Store. Get help on primary cementing problems from your Baker Serviceman.

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Available worldwide. Sold only through Supply Stores in U.S. and Canada.

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THIS BEAN LASTS FOR THE FLOWING LIFE OF A WELL!

Low cost, renewable inserts take the cutting action

With ordinary care, a single UNIBOLT Master Bean will last for the entire flowing life of a well. These beans are threaded to receive an inexpensive screw insert. The cutting action of sand-laden production is imposed on the expendable insert, not the master bean.

The inserts are not only inexpensive, they are easier to change than regular beans. Drilled in increments of 5% and 10% of well flow, as well as in increments of 1/64th inch, these inserts provide the versatile range of an adjustable choke with the fine accuracy of a positive orifice.

This is only one of a number of refinements in flow bean design perfected and introduced by UNIBOLT. Others are: shaped entrance to reduce turbulence and maintain flow accuracy, "flow-rating" as a standard inspection procedure to insure correct orifice sizing, and special analysis alloys and heat-treatments for corrosion and wear resistance.

UNIBOLT flow beans are designed to fit only UNIBOLT Positive Choke Bodies and Cage Nipples.

Request UNIBOLT Positive Choke Bodies and Cage Nipples from your Christmas tree supplier and be assured of the finest in dependable flow control.

Unibolt screw inserts are easy to change, and they protect the master bean against cutting.

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THORNHILL CRAVER CO.

P. O. Box 1184, Houston, Texas

start on the season that the company will be able to drill two more holes with the same rig during freeze-up.

The river route was chosen because roads in the area were too soft for overland movement of the rig. The terrain of the location for the first planned test, No. 5 Ft. Nelson, also affords the opportunity to beat the season, being on firm ground near the high river bank, rather than on the usual muskeg.

Western Natural, which ignited the northeast British Columbia play with its discoveries at Petitot River and Kotcho Lake in early 1959, plans a total of five holes this season, including the No. 5 Ft. Nelson. Two rigs will be used.

The No. 5 is located 1½ mi. west-southwest of the No. 3 Ft. Nelson, in the Clark Lake field, which yielded gas at the rate of 135-million cf/d on open flow. This flow came from the thickest producing reef section found in the area so far—364 ft. of continuous, porous Dolomite above the water line in the Middle Devonian.

The Clark Lake field already extends some 15 mi. along an east-west trend. Western Natural hopes to extend it 5½ mi. to the east during this freeze-up with the drilling of No. 7 Clark Lake. The company also plans one test in the Kotcho Lake area and another 2 mi. east of an unsuccessful Slave Point test 12 mi. north-northwest of the Kotcho discovery. The fifth test will be drilled in the Petitot River area, 1¾ mi. southeast of No. 2 Petitot River, which was completed last season for an absolute open flow potential of 185-million cf/d.

A ready-made program is awaiting Pan American Petroleum Corp. at the start of freeze-up.

At last spring's break-up, rigs were left in place at three Pan Am ventures: No. a-51-A, Komie Lake, midway between Clark Lake and Petitot River; No. a-90-I, Deer Lake, 40 mi. southwest of Petitot; and No. a-31-I, Cam Lake, 10 mi. north-northwest of Petitot and 10 mi. southeast of Celibeta Lake.

There will be further drilling at the Komie Lake and Deer Lake tests. The Cam Lake test has been taken to total depth. A Pan Am spokesman says all three were left in a "suspended state" and are being held tight. He adds that all three tests had gas shows.

He says Pan Am will go back to these three holes "to complete or finalize them," and adds that the final shaping of subsequent drilling plans depends on the outcome of these tests.

Pan Am will have four rigs in the Ft. Nelson area—one rig in addition to the three left in.

The company's No. 1-A Beaver River, b-63-K, 88 mi. west of Petitot, has stirred considerable interest as a Slave Point discovery. Due to mechanical difficulties, however, Pan Am was unable to complete it as a producer and the rig was removed. Pan Am does not expect to drill in that area this freeze-up, despite reports that the Beaver River test drilled through a gas pay section more than 300 ft. thick, and that drillstem tests below 11,000 ft. yielded gas at rates up to 6-million cf/d.

Two tests are planned by the Home Oil group in the Celibeta Lake area, just across the British Columbia border in the Northwest Territories.

Last season's operations were brought to a close with successful completion of the Home et al No. 2 Celibeta, a Slave Point wildcat which flowed gas at the rate of 8-million cf/d through ½-in. choke. It was reported last spring that the flow was gradually increasing as the formation cleared, and that tests were proceeding.

Other companies are expected to contribute to the over-all record level of activity in the Ft. Nelson square.

Tennessee Gas & Oil Co. will be looking for Slave Point gas in the general Kotcho region.

Sinclair Canada Oil Co. also has plans for two tests in this region. Sinclair may drill a total of eight tests this season, some being contingent on purchase of land in the forthcoming lease sale. Sinclair also will be going back to the Klua Creek area, where a Slave Point success was posted several years ago. A service rig will be moved in for reentry at the suspended hole.

Other companies with plans for the area include Texaco Exploration Co., operator for the Northern Foothills Agreement Group (Texaco, British American, Shell Oil Co. of Canada, Ltd., Mobil Oil of Canada, Ltd., Tennessee Gas & Oil, Atlantic Refining Co., Pacific Petroleums, Ltd., and Phillips Petroleum Co.).

Drilling programs of Phillips and Pacific are being delayed somewhat by merger developments. Pacific was active last season in the Kotcho region (completing one hole as a Mississippian gas well at 2,156 ft.), and Phillips at Kledo, 40 mi. west-northwest of Ft. Nelson.

Texaco says it is "a bit premature" to announce its full winter plans in light of the November land sale. The company, however, left a rig last spring at Texaco-NFA No. c-15-L Maxhamish, 38 mi. northwest of Petitot and 6 mi. south of the NWT border. It plans to complete this Middle Devonian test, now classified as a tight hole, this freeze-up.

DRILLING BRIEFS

DRILLING MUD DATA — REPORT 60-4

DRISCOSE* Lowers Drilling Costs . . . Letters tell us why!

Since we started these bi-monthly newsletters, we've been getting many reports from the field with drilling case histories and anecdotes of our products in action. Here is the substance of some recent letters that we'd like to pass along.

North Texas Mud Program A Big Success.

A Texas mud engineer has written us about the success of our North Texas mud program. This Driscose low-solids mud program was prepared at the request of an operator in the area and was based on a test well representative of the locality. Comparison with three nearby wells using different programs showed drilling savings of $7485, $5243, and $4864. In all three comparisons, reduced drilling time and lower bit costs using Driscose accounted for most of the savings, although in two instances, mud costs for the test well were also less.

The low-solids system using Driscose has a low mud weight (9 lbs.), low gel strength, and a fairly low viscosity. In addition to providing increased penetration rates, these conditions also keep mud losses to a minimum — especially in the 4200- to 4800-foot region where fluid losses had previously been high.

Because of the success of the Driscose test well, our "mud guide" is now being widely followed throughout North Texas. While the mud engineer on the job must make the "decisions of the moment" (changing viscosity, chemical treatment, etc.) to suit the particular well, the "guide" specifies such factors as: percent of oil (up to 4%) . . . the rate of adding High Viscosity Driscose (100 lbs. per drilling day from surface pipe to TD) . . . basic chemical treatment (caustic, soda ash, thinners) . . . top limit of mud weight (9.6 lbs./gal. below 4200') . . . table of best funnel viscosities for various depths (from 32 at surface pipe to 125 at 7000 feet) . . . recommended viscosity for running logs and casings, etc. This North Texas mud program will be furnished upon request. Let us know if you're interested.

Comments from Louisiana

The following comments are quoted from recent letters received from Southern Louisiana operators.

DISTRICT ENGINEER SAYS: (St. Mary Parish) "Wall cake was reduced from 1/16" to 1/32" after we started decreasing chemical additions and using Driscose to control solids."

SUPERINTENDENT SAYS: (Vermilion Parish) "We figure we saved $2 000 on weight material by using Driscose in a gyp mud to suspend barite."

MUD ENGINEER SAYS: (Cameron Parish) "Driscose not only controlled water loss, but it actually reduced viscosity in a gyp-saltwater mud!"

DRILLING ENGINEER SAYS: (Offshore) "We tried other materials in both lime and low pH muds, and found the cost was twice as much as when we used Driscose."

CORROSION ENGINEER SAYS: (Lafayette Parish) "We had to displace clear fluids in 12 wells with a Driscose packer mud to help prevent pipe corrosion."

Big Savings Reported on Canadian Wells.

Letters from Alberta tell us of the effectiveness of Driscose low-solids mud systems in the Pincher Creek and Waterton Lakes areas. Here, Driscose low-solids programs have increased penetration rates, improved drilling conditions, and reduced over-all well costs. A cost comparison between a 6000-foot well recently drilled with Driscose low-solids mud (4 to 8% solids) and one of equal depth drilled with a higher-solids mud (10 to 17% solids) showed a $7940 net saving. This saving is even more remarkable in that the well selected for comparison was one of the fastest drilled in the area before the introduction of Driscose low-solids mud.

Performance counts . . . and Canadian operators report that Driscose low-solids muds are now accepted procedure in the area.

*Driscose is a trademark for Sodium Carboxymethylcellulose.

DRILLING SPECIALTIES COMPANY
Bartlesville, Oklahoma

The Competitive Squeeze Forces Suppliers

The trend to fewer stores with bigger inventories is being accelerated due to overcapacity. Some suppliers say "supermarket" outlets may be in the offing.

The supply segment of the petroleum industry apparently is headed toward the biggest consolidation movement in its history.

This is one of the sharpest conclusions drawn this week from a PETROLEUM WEEK survey of oilfield suppliers across the nation, by mail and by personal interview.

The majority of suppliers agree with this prediction by W. J. McWilliams, president, Republic Supply Co.:

"I feel that the trend in the oilfield supply business will be toward fewer stores with better inventories. The large companies are already going in that direction and the continuation of hard times should bring on attrition among the medium and small-sized companies."

Like the operating end of the petroleum industry, the supply business is in a tight squeeze because productive capacity is far in excess of demand.

"Any one of our bigger manufacturers can make all the equipment that the oil industry needs," explained a vice-president for one large supply firm. "Yet, here we are, all competing for a bigger share of a shrinking market."

"We are part of an industry that has been geared up to supply goods and services at a level far in excess of the current or foreseeable demands of the industry we serve," commented McWilliams. "In plain words, there is an oversupply of manufacturing and merchandising facilities set up to serve the oil and gas industry."

PETROLEUM WEEK received the same type of comment from supply company executives throughout the oil patch.

This over-capacity situation, in fact, is one of the primary reasons for the current move to diversify (PW—Jul. 8'60,p19).

From this fundamental cause spring the various symptoms that are plaguing the supply segment—low profits, ruinous competitive practices, and more.

Both profit margins and sales have declined for the suppliers (PW—Jun. 17'60,p34; May 13'60,p27).

Price cutting has almost become a way of life, according to suppliers, who complain also of "too many free services" for customers.

Such ills are becoming so bad, some believe, that in the words of one executive, "What this amounts to is a massive demonstration of killing the goose that laid the golden egg—the time will come when some of the supply companies will be forced to close their stores."

The suppliers agree, almost unanimously, that "there are too many supply stores in existence."

Opinion varies as to just how many stores there should be.

Economically, many stores do not justify their existence. They are holdovers from a day when there was an oil boom in a particular area. The stores remain, long past their day of profitability, because the supply company fears the loss of "representation" there will hurt it elsewhere.

Voicing the thoughts of the overwhelming majority, Rainey Elliott, president, Jones & Laughlin Supply Division, commented:

"In my opinion, there are entirely too many supply stores in existence—a supply store in current times can efficiently handle a large area considerably better than a decade ago.

"Such factors as paved roads, fast pickup trucks and automobiles, two-way radio communication—all contribute to this fact.

"Obviously, the larger area that a store can serve adds to the profitability because of the lack of capital investment in buildings, inventories, and labor."

Why do suppliers continue to operate unprofitable stores? Competition, status, a sense of obligation, and plain old hope seem to be the main reasons.

Some of these facilities are "prestige" stores. By keeping them in operation, a supply company can point to a kind of saturation coverage of the oil patch—even though some of these marginal stores may carry only limited inventories. Status, apparently, is the factor.

More cogent, perhaps, are these typical reasons advanced by W. D. Wilson, president, Wilson Supply Co.:

to Consolidate

"After the bloom goes off a field, there still is a need for production equipment, and oil company customers like to see the company store stay in.

"Frequently, the supply company feels a sense of obligation to its customers and keeps a store—to feel that each new wildcat may bring in new production. So they keep hanging on."

Perhaps the strongest factor of all, Wilson pointed out, is the competitive element.

Since the supplier frequently finances a drilling contractor, seeing him "through thick and thin," he doesn't want to chance losing his business to another supply company.

"The reason for so many stores, whether it is good or bad—and there are too many of them, I admit—is that competition brings it about," Wilson said. "I'm not saying it is a good thing, but that's the way it is."

Another problem besetting the supply houses is the "mixed selling" method through which manufacturers sell direct to the customer or through brokers, rather than through established supply outlets.

In an outspoken comment on this

point, Mike Hunt, president, Longhorn Supply Co., declared:

"If we are to stay in business, I can't see a continued operation of glorified telephone booths and coffee houses. There should be an end to the situation where some manufacturers will accept an order, no matter how it is placed—even through a dime store."

C .T. Jones, vice-president and sales manager, Oil Center Tool Co., said, "We know there are many cases of mixed selling, both direct and through distributors.

"In the wellhead industry, the majority are still selling only through supply stores. More companies in the [supply] industry have been selling direct in the last few years due to pressure from the oil companies for reduced prices on large orders."

For this the suppliers tend to blame currently low standards of ethics both within the supply ranks and within "the purchasing profession."

Here are some typical comments:

". . . We've got to get our ethics back up where they should be."

". . . The policy of selling to any so-called supply company enables many of this type to skim off a percentage of the business with virtually no investment in inventory or receivables, while furnishing no service. Because of his lower cost of operation, such an operator can cut prices, thereby damaging those companies carrying on a legitimate type of business."

". . . The purchasing profession, as such, has lost some of its integrity. Purchasing people mouth a lot of philosophy on price being last in their consideration, but actually do their buying on that basis. They have compelled the normal sources of supply to wallow down in the dirt with the guy who has nothing to offer but price."

". . . As a supply company we are asked by the oil companies to give them all sorts of assistance and help in getting their job done—from research and development to an offshore communications network. Yet they class us in some areas on exactly the same basis as a local broker who has set himself up 'in the supply business.' "

Even when the order goes through a supplier, the direct-shipment method cuts his profit below the point he thinks economic for his continued operation.

"While it is certainly the policy of all oil companies, big and little, to get their materials through supply companies, it also is true that some buyers within those companies do not completely agree with that concept," asserted the president of one supply company.

"That is one of the things that is confronting the supply business today," he continued. "It is becoming the custom to ask for direct shipment on all large purchases.

"On a direct factory shipment, the supply company may make around 5%. Yet a supply company must have a 15% to 20% margin on a sale from field stocks if it is to survive."

Declared the president of another supply company:

"In many cases the manufacturer assesses little or no penalty for drawing from the warehouse stock as against factory shipment.

"The best thing that could happen to the supply industry would be the complete elimination of manufacturers' field stocks."

While suppliers are fully aware of their difficulties, and the causative factors, they are far from agreed as to what should be done.

One supply company executive, for example, objected to public recognition of the suppliers' plight, on the ground that suggested solutions would just "create controversy."

Many of the companies contacted in the survey indicated that their planning for the rough road ahead consisted only of trimming costs and taking the most basic of corrective measures.

Others see a lessening of some of the future problems because of today's awareness of the situation. George E. Failing Co.'s H. J. Godschalk, for instance, said:

"The present economic situation in the industry should cause a manufacturer to evaluate carefully before moving into a specific area. This, in itself, will have the tendency to cut down on the number of supply points."

And while nearly all suppliers believe that the individual supply store can cover much more territory adequately today, there is a general lack of accord on how this can be accomplished.

Most of the suppliers agreed that the entire Louisiana-Texas Gulf Coast, from New Orleans to Brownsville, could be handled adequately with ten or less stores. Some of the companies are, in fact, doing just that.

Yet there are spots within this region where one company might have a half-dozen or more stores within a 100-mi. radius.

Some of the companies plainly feel they can not safely shut down a given store, even if it is a liability, when a competitor is maintaining a store there —and there is a decided hesitancy to be the first to make such a move.

The majority, however, agree that a single store can handle an area ranging from 50 mi. to 200 mi. in radius, depending upon the nature of the country and the amount of activity in the area.

Failing's Godschalk said: "A supply store, well-stocked and equipped with a dependable staff, should handle an area of 10,000 sq. mi. This would be dependent to a certain extent on travel conditions in the area.

"Few field men are required to service a given area when the supply store is adequately stocked with items needed by area operators. Emphasis should be on delivery service available."

New ideas and concepts, and an awareness of reality are beginning to appear. There is, for instance, a fairly common acceptance of the belief that direct selling is here to stay.

"The supply business is changing and will have to change even more in the future," observed OCT's Jones. "Out-of-stock deliveries of pipe from supply stores are becoming things of the past.

"The gravy from pipe and other direct shipment sales has financed the small-margin store operations—deliveries and rig calls. I believe in the future the stores will operate more as warehouses than stores, and most selling efforts will be directed toward direct shipment accounts."

J & L's Elliott stated: "It seems rather apparent that the trend toward direct shipment business from manufacturer to the oil company, with the supply company selling and servicing the account is on the increase.

"Likewise, the trend of placing such orders is being diverted from field personnel to central division or general office headquarters.

"Obviously, this lessens the importance of the inventory on the ground, in the eyes of many operators, chiefly because there is a financial saving in most cases between the direct shipment price and the price required from suppliers out of their invested stocks."

But many concur with Elliott in this additional view:

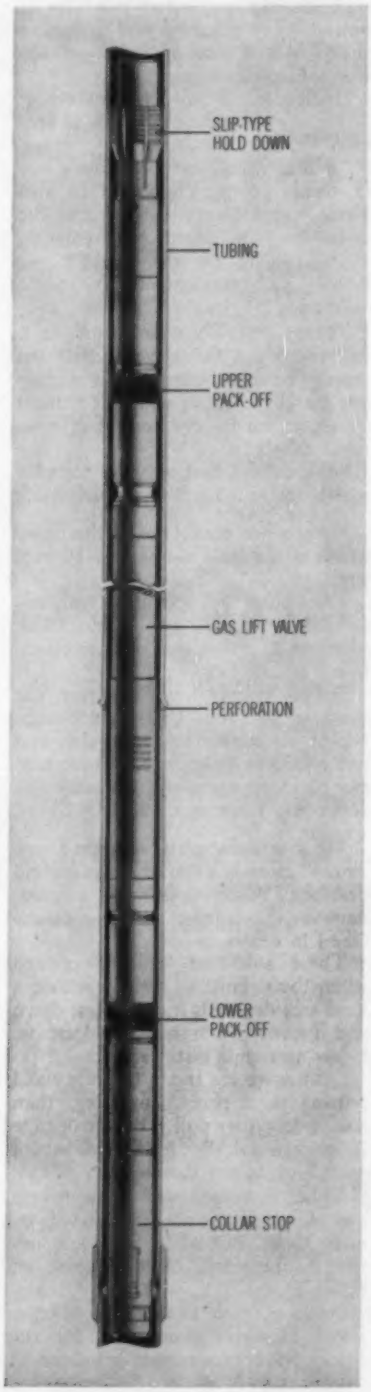
"We do not agree with this concept for the reason that warehousing and material handling quite often cost the operators more money than having the service performed by their nearest supply store.

"It is conceivable that such present day trends will continue to the point that the oilfield supply business, from a store-delivery standpoint, will be-

SPECIAL REPORT TO MANAGEMENT

OTIS PRODUCTION NEWS

Volume II, Number 3 **Otis Engineering Corporation • Dallas** *Production Equipment and Services*



Cost-Conscious Producing Companies Endorse Otis All Wire Line Technique Of Converting Wells to Gas Lift

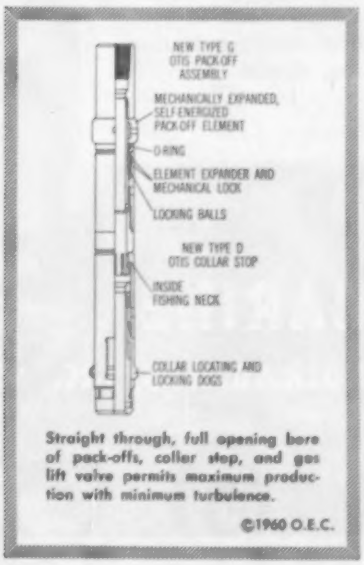
CORPUS CHRISTI—Eliminate the cost of a pulling unit to round-trip tubing when converting a well to gas lift and you can save an impressive amount of money per well. That's what several of the major producing companies in this area discovered when they started using the new Otis "All-Wire-Line" Gas Lift Conversion Technique.

A spokesman for one of these majors recently stated that his company is most enthusiastic about the technique — especially for water locations — because "(1) it's faster, (2) it's less expensive, (3) it's every bit as efficient as other types of installations they have made, and (4) it eliminates the risk of damage to the producing formation from contamination by mud and/or water in the annulus." Another company reported a savings of $60,000 in converting three, readily accessible, land locations.

As an example of how the technique can reduce the cost of a conversion, take a look at the following case history: A 6800-foot well located in approximately three feet of water in the Copano Bay Field ceased to flow naturally and was scheduled to be put on gas lift. In making plans to have the work done, it was discovered the approach canal had filled with silt and sand, which meant an expensive dredging operation would be necessary before a barge-mounted workover unit could be moved onto location; cost of a workover unit would be $1400 per day, and the annulus was loaded with old drilling fluid. Estimated conversion costs were mounting fast. A conference with the Otis Gas Lift Specialist in the area convinced the operator he should try a Type CG Otis Pack-Off Gas Lift Valve installation.

After setting a circulating plug in the tubing at the spot indicated for the lowermost valve, perforating and circulating mud from the annulus, it took the trained Otis Wire Line Specialist only 15½ hours of wire line time to perforate and install five concentric Type C Gas Lift Valves between Type G Otis Pack-Off Assemblies and have the well ready to be put back on production. Eight months following the conversion, the well was still making its allowable in an economical and efficient manner. And to attest to the reliability of the new Type G Otis Pack-Off Assemblies, the well was being produced from the lower-most valve.

Otis Gas Lift and Completion Specialists are interested in helping you find a way to complete and produce your wells in the most efficient manner. The experience these men have accrued throughout the years is yours to draw from when faced with any down well completion or production flow control problem. Use the knowledge these men have to offer and you will find you'll be spending your production dollars more efficiently. For more information on the Type CG Otis Pack-Off Gas Lift Valve, call the Otis office nearest you or write Otis, Dept. 3-W, Box 35206, Dallas 35, Texas. You'll find your Otis specialists ready to help you — anxious to serve you.


NEW TYPE G OTIS PACK-OFF ASSEMBLY
MECHANICALLY EXPANDED, SELF-ENERGIZED PACK-OFF ELEMENT
O-RING
ELEMENT EXPANDER AND MECHANICAL LOCK
LOCKING BALLS
NEW TYPE D OTIS COLLAR STOP
INSIDE FISHING NECK
COLLAR LOCATING AND LOCKING DOGS

Straight through, full opening bore of pack-offs, collar stop, and gas lift valve permits maximum production with minimum turbulence.

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OTIS

Engineering Corporation

General Offices:

6812 Denton Drive • Dallas, Texas

come so unprofitable that they will cease this part of their operation."

There is a growing belief, resisted by some operators, that more areas will be served by a single, well-located supply point—supplemented, perhaps, by small, more or less temporary facilities within the area.

This "centralized warehouse" concept has by no means been accepted as a feasible operational step by the majority of suppliers.

The reason is that the concept rams head-on into the idea that a loss of business will result if a company fails to have a store in a given area where competitors do.

But all recognize the value of concentrating inventory and personnel, reducing real estate and tax costs, increasing efficiency in accounting, and the like—"if everyone would do it."

Failing's Godschalk said in support of this approach:

"If a centralized warehouse is completely stocked and has good delivery service available to handle both routine and emergency orders, this would appear to be the most economical manner in which to service an area. Duplication of expense and effort could thus be eliminated."

There seems to be a gradual leaning toward the opinion that "for all practical applications, it [the centralized warehouse] would probably work. In extreme emergencies, a supply store could run a pickup or truck quite a distance for the price of maintaining separate stores."

Houston Oil Field Material Co., in fact, already has tested this type of consolidation program and is moving ahead with it now as a proved operational procedure.

Homco began the program on an experimental basis as far back as January, 1959.

"We felt that there must be a way to avoid keeping a store in an area where it is losing money, and at the same time maintain representation and service in the area," said C. L. Roach, vice-president for domestic operations.

"There certainly wasn't, and isn't, any question about the fact that the supply business operates on a very low margin of profit and that it must cut down on its overhead if it is to make money.

"We believe that we have found a way to accomplish these objectives."

Homco has consolidated the operations of 25 field stores into 10 outlets.

The company began its actual consolidation program in March, 1959, when its 25 stores had been in operation.

By the end of June, this year, the company had reduced the total number of its supply stores by 16, and had added one new store. There now are 10 stores remaining to serve the entire area formerly covered by 25.

The company plan visualized one "main" store in each of six operating divisions. When conditions warrant, however, "substores" will be established in active areas.

These substores will be opened when the volume of activity within a local area demands it, then shut down and moved when activity decreases below economic justification.

"What we are trying to do is avoid putting in a permanent store, then having to either pull it out or operate it uneconomically for a couple of years," explained Roach.

"The customer will know where our main store is and that it will remain there. But when his needs justify it, there will be a substore set up."

As an example of this type of operation, Homco's main store for the Rocky Mountain region is located at

Under and above the sea..
Protection!
OFFSHORE OIL INSURANCE
From the top of the rig to the bottom of the hole, offshore oil drilling and production calls for experienced specialists—no less in the area of your insurance coverage than in any other. Your insurance agent or broker knows that Southern Marine has specialized in arranging proper coverage for offshore drilling and production equipment since the earliest days of offshore exploration, and that we know too how much prompt and proper servicing of losses can mean to you. Ask him about Southern Marine know-how and service.
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& AVIATION UNDERWRITERS, INC.
610 Poydras Street, TUlane 5266, New Orleans 12
L. K. GIFFIN, President

Survival of the Fittest

A month in the woods with only a bare survival kit separates the men from the boys, with a vengeance. Darwin's law of the survival of the fittest still pertains today in connection with certain segments of the oil industry. And this matter of survival in the oil business is a deadly serious one, not separating the men from the boys, but the quick from the dead.

What can be described casually as a "technical readjustment" by someone in a newsletter is an entirely different matter to the man whose bread and butter are at stake. Many supply stores, for example, are looking for a survival kit of their own, after taking a long, hard look at the age of their receivables. What to do with receivables 90 and 120 days old requires as much skill and know-how as living a comparable time in the woods with only a pocket knife.

Unfortunately there's no magic wand, no miraculous rescue by helicopter. The best help you can get is from a man who knows your business, knows the oil business, and understands credit and the management of money. You'll find men like these in the Oil and Gas Department of The National Bank of Commerce of Houston. You'll find that if anyone can help you they can. But, remember, they work no miracles; so come before it's too late to help.

THE NATIONAL **BANK** OF
COMMERCE
OF HOUSTON

MAIN, TRAVIS, AND CAPITOL
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Casper, Wyo. But the company has a substore at Kimball, Neb.

"In every case," Homco reported, consolidation has been successful.

Roach noted, for example, that Homco originally had stores at Corpus Christi, Freer, and Alice (plus other points) to serve part of the Southwest Texas area. It is less than 50 mi. between Corpus and Alice and between Freer and Alice. So Homco consolidated the Corpus and Freer stores into the Alice installation.

"All of these were costing money to operate," Roach pointed out. "All had the same kind of overhead. When these stores were put in, conditions were different. Transportation and communications were difficult.

"Now, we felt, one store could cover the territory formerly handled by all three.

"Before the consolidation, the Alice store was near the bottom of the list for all Homco stores on both sales and profits. Now it is near the top of all our stores."

In another consolidation of this type, Homco combined its former stores at Harvey, Morgan City, and Houma, La., into the Houma store.

"Our experience already shows that in every case where we have consolidated our operations, it has paid off," Roach reported.

Homco has met the "representation" problem by retaining full-time sales personnel in the locations where it formerly had stores.

At many of the locations, Homco has offices for its various services, such as fishing and cut, directional drilling, electric wireline service, and rental tools.

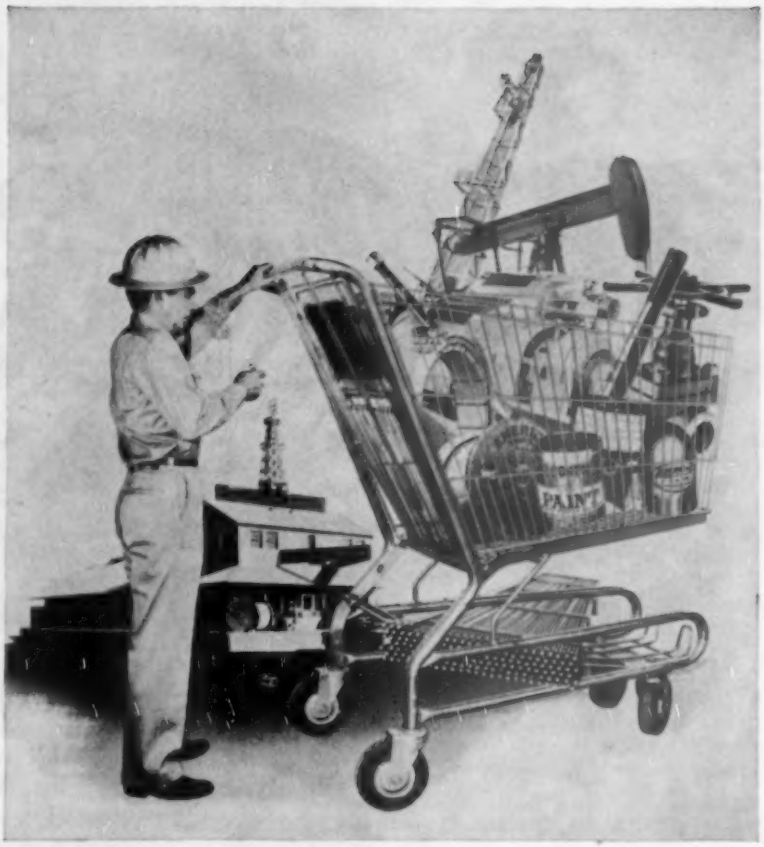
The sales personnel at these locations headquarter at the service office.

But, in any case, Homco is maintaining a sales representative in any town where it closed a store. He operates pretty much on the same basis as before. Deliveries, however, are made from the main store in the area.

And, said Roach, the company has taken other steps, such as making its sales and service personnel more "versatile" and by offering commissions in addition to salary for both sales and service volumes above a certain base.

"If our men do a good job, we want them to be paid for it," he continued. "But they must make a contribution, also."

Whether other supply companies would find the same type of program suitable is problematical. But it has been suggested that some kind of "supermarket" store might be the answer to reducing overhead, yet maintaining representation.



"SUPERMARKET BASKET," loaded with various oilfield materials, typifies the supermarket supply store concept being advocated by some suppliers in the industry.

Here's how this would work:

In certain areas, where activity is too low to support several individual supply stores, manufacturers would pool their inventories in one store.

Each of the suppliers would agree to stock an adequate initial inventory on consignment and to maintain it.

The customer would have his choice among the same variety of products at one supply point that he now has at several stores.

One of the suppliers could take on the job of running the store for an agreed-upon share of the revenues.

Preferably, however, the store would be run by an independent third party on a strict commission basis.

"There are a lot of places in this country where this would work," contends a vice-president for one large supply company. "These towns once supported a number of supply stores because of a high rate of activity in nearby fields which now are far past their prime and cannot possibly support all those stores.

"Why couldn't the supply companies get together, select just one from dozens of such places, and give this thing a whirl?

"If it panned out, they could gradually expand the system. Just think of the savings in overhead."

There is more than considerable doubt, however, that such a supermarket supply store would work.

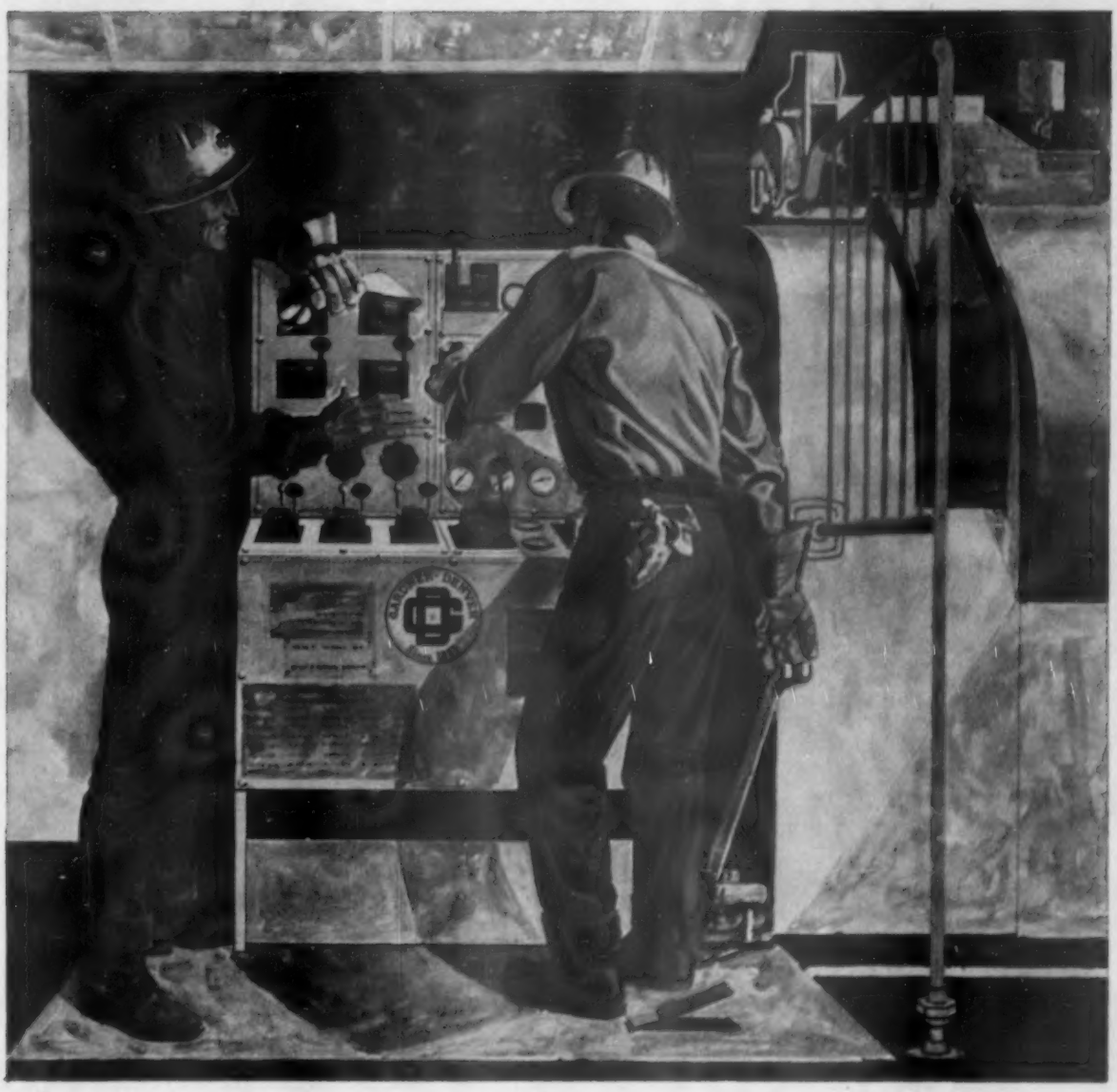
"A supplier is just not about to turn his inventory over to another supplier or to a third party, because he refuses to believe that either of them can run his business as well as he can," argued one official.

"Conflicting lines of material would be involved. Sooner or later, there would be a suspicion that the store operator was favoring one line or another. It just wouldn't work."

One top official of a major supplier added:

"One of the biggest drawbacks to such a plan is the very competitive nature of the supply business. We are highly competitive and fight like hell for business."

A manufacturer's agent said he tried to get such a program started on the West Coast. He erected a building with warehouse and office space and a central telephone exchange, but the venture was unsuccessful. "I've rented



He sells speed to oil men

Here, at the control panel of a Gardner-Denver "2100" drawworks, a Gardner-Denver Petroleum Specialist is introducing a new concept in efficiency: operation so smooth, and with such ample reserves of hoisting and braking power, that it amazes even veteran drillers.

But the Gardner-Denver Specialist is selling more than just a product.

He is selling *speed—drilling speed* that can save days and even weeks of time. The "2100" drawworks is part of a completely co-ordinated Gardner-Denver ultra-modern rig, capable of drilling today's deepest wells at record-making paces.

Gardner-Denver Petroleum Specialists have a single objective: to serve you better, thus assuring your *continuing* satisfaction. That is why so many oil field buyers prefer to deal with Gardner-Denver.

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LOOKING UP—Length of drill starts into the hole after change of bits. Falcon Seaboard Drilling Co. of Tulsa is drilling this well with a 9,500-foot string of Pittsburgh Seamless 4½-inch Grade E drill pipe. Falcon Seaboard has used Pittsburgh Steel tubular goods and an independent distributor for many years with pleasing results.

Pittsburgh Steel's Independent Distributors...

PUT THIS IN YOUR PIPE---SERVICE!

Drillers who use Pittsburgh seamless on well after well have a lot more than dependable drill pipe, casing and tubing going for them.

They have what Falcon Seaboard Drilling Co. of Tulsa calls "fair treatment from the mill" and—independent distributors who go more than the proverbial extra mile to provide service.

Boone Smiley, manager of the Mid-Continent Area for Falcon Seaboard, said:

"We've used Pittsburgh Steel's independent distributors through the years in times of short supply and when pipe was readily available. We've always felt that Pittsburgh Seamless did a job for us and the mill has always been fair."

Photographs on these pages show effective results of the close relationship between drillers and operators on one side and a Pittsburgh Steel independent distributor on the other. Here, near Maysville, Okla., Falcon Seaboard is using 9,500 feet of Pittsburgh Seamless 4½ inch O.D. Grade E Drill Pipe on the fourth well the string has drilled in the area in recent months.

The independent who supplied this drill string to Falcon Seaboard sold the first string of oil country tubular goods manufactured by Pittsburgh Steel. Continued progress through the years has been based on *service* to the trade.

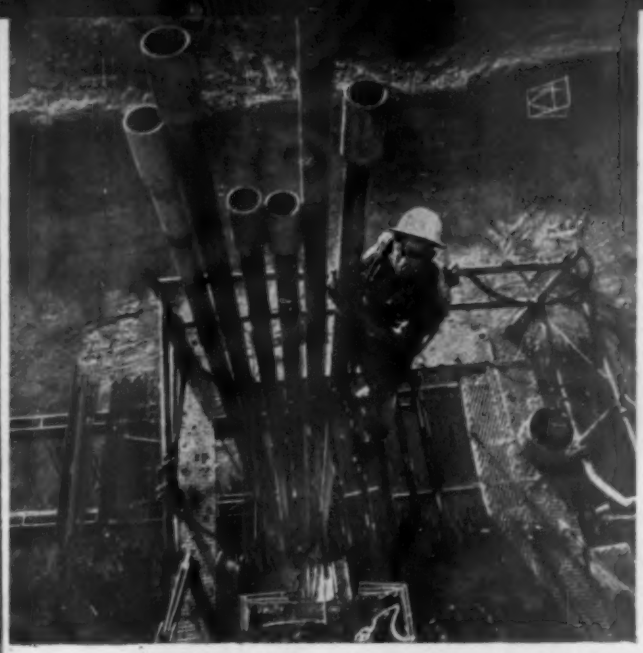
"We can't afford to get lazy," declared William G. Rudd, the distributor's sales manager. "The oil business is always subject to critical emergencies and they all have big dollar signs. It's up to us to pitch in and help."

As a case in point, during periods of acute shortage, this distributor set up a service called the Mid-Continent Pipe Exchange. As a free service to the industry, oilmen were polled for tubular material which they wished to swap for goods more strategically located, or more suited to their needs.

This extra service by Pittsburgh distributors is matched by the extra stamina you always get in Pittsburgh Seamless Drill Pipe—a stamina which stems from long experience in making special steels for the special jobs in the oil country.

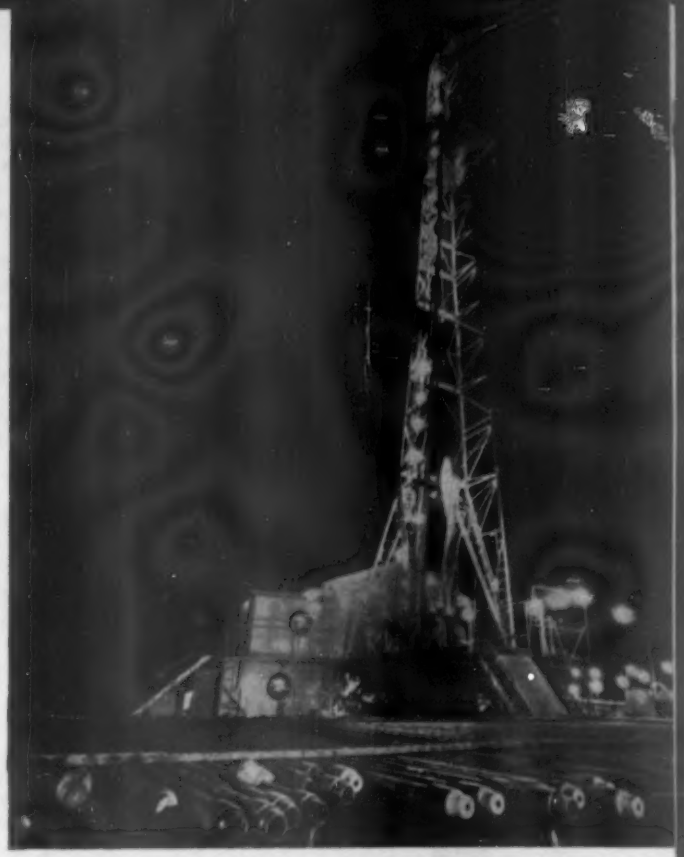
When you buy your next string of drill pipe, or when you're ready to run casing or tubing, remember the combination of Pittsburgh Steel Co. and independent distributors offers you the kind of service—plus the utmost in dependable seamless tubular goods—that isn't available any other place.

It's easy to get lined up with an independent. They're listed at right. Call the nearest one today for quality seamless tubular products.

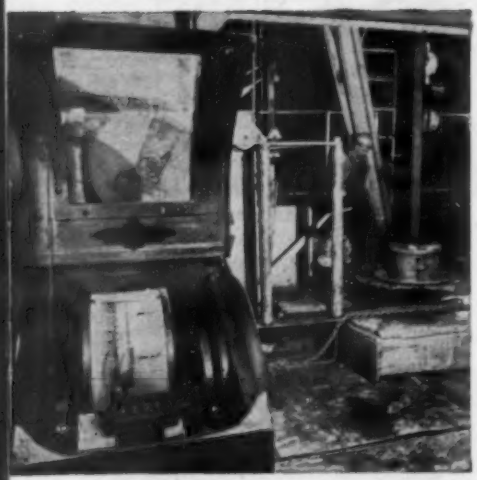


LOOKING DOWN—On monkey board of 131-foot, A-mast rig, roughneck gets joint of Pittsburgh Steel Co. drill pipe ready for re-entry during a trip. The 9,500 feet of drill pipe shown at top and on racks below was used to drill three previous wells.

Driller Oliver Clark, left, chats with Max Thomas, distributor's representative, and Jewel Smith, Pittsburgh Steel field engineer.



Falcon Seaboard Drilling Co.'s No. 35 rig is at work here on a Sunray Mid-Continent lease near Maysville, Okla.



Geolograph on same rig shows hole is at 4,296 feet with the rotary table, seen at right, operating smoothly. Geolograph chart indicates driller is midway between joint connections.

Distributor Home Offices

Bennett Supply Company Midland, Texas
Atlas Bradford Company Houston, Texas
Buckeye Supply Company Zanesville, Ohio
C. W. Cotton Supply Company Tulsa 5, Oklahoma
Franklin Supply Company Denver 10, Colorado
Houston Oil Field Material Co. Houston, Texas
Industrial Supply Company Wichita Falls, Texas
Iverson Supply Company Tulsa, Oklahoma
Longhorn Supply Co., Inc. Houston 14, Texas
Lucey Export Corporation New York 7, New York
Lucey Products Corporation Tulsa 19, Oklahoma
McJunkin Corporation Charleston 22, West Virginia
Midland Supply Company Wichita 7, Kansas
Mountain Iron & Supply Co. Wichita 2, Kansas
The Producers Supply & Tool Co. Fort Worth 2, Texas
Production & Refining Equipment Company Odessa, Texas
Sandy Supply Company Wooster, Ohio
Southwest Supply Company Pittsburgh, Pennsylvania
The Straker Supply Company Jackson, Michigan
Superior Iron Works & Supply Co. Shreveport, Louisiana
Tex-Tube, Inc. Houston 7, Texas
Western Supply Company Tulsa 1, Oklahoma

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half my building to a janitor supply business," he reported.

Many others also noted that a supermarket supply store would be "too much of a job for one man." Several also wondered: "How would the manager answer to different masters? There would bound to be conflict of interests."

Examples of bold, imaginative departures from conventional approaches aren't plentiful. But some proposals, such as selling the supply store at the highest level of operating company management, probably deserves consideration.

It has occurred to some supply people that many of their problems might be solved if they could get across to operating company top management what the supply companies are faced with, and how valuable they are.

"We've fallen down on this somewhere," said one supply company executive. "The supply industry needs to have its story told more convincingly than ever before.

"It won't do any good to put this story across to the lower echelons of oil company management. The efficiency of purchasing people is gauged by their reporting of great savings. That is an erroneous basis on which to judge their performance.

"The suppliers need a person of demonstrated industry stature who can command the attention of top management in the oil and gas companies.

"This type of man might be able to convince the higher executives that some of the present practices are not only going to wreck the supply business but, eventually, are going to hurt their own companies."

Leasing store facilities, rather than purchasing real estate and building a company store, is one route being taken to cut possible investment losses.

Wilson Supply is one of the companies that has made this a policy.

"We're leasing almost everywhere," said Wilson. "If a field plays out sooner than expected, we can reduce investment losses by subrenting."

Some companies also are utilizing electronic computers to help them with inventory control—taking fast, periodic inventories to keep informed about items that are moving and those that are not, and where.

There also are programs for better training of personnel, consolidation of basic facilities, efforts to accommodate selling to changing patterns of purchasing, and suchlike.

Most suppliers also feel that some form of written agreement between manufacturers and distributors is desirable, providing it is "more than just a piece of paper" and yields mutual benefits.

The majority of suppliers seem to agree with Republic's McWilliams that "present agreements in use are, for the most part, meaningless."

All those favoring better arrangements were emphatic that such agreements should work both ways—the manufacturer should distribute only through licensed outlets and the distributor should maintain an adequate inventory of the manufacturer's products.

As Longhorn's Hunt expressed it: "Manufacturers and distributors should have more loyalty toward one another. If the distributor does a good job, the manufacturer should stay with him.

"The manufacturer should look at the over-all picture for a period of time, instead of just one sale.

"There should be these commitments: (1) the supply store will carry a minimum inventory of materials, and (2) the manufacturer will not

JONES CONSTANT RESEARCH LENGTHENS ROD LIFE

From its beginning in 1894, Jones research has been working ahead anticipating tomorrow's sucker rod requirements. Deeper wells and heavier loads have created an ever-increasing demand for higher and higher strength rods . . . a demand that has always been satisfied by Jones advanced designs. Jones constant search for improved chemical composition and new processing techniques has provided the industry with tougher, longer-lasting sucker rods to meet every pumping requirement. Always specify Jones . . . sucker-rod specialists since 1894.

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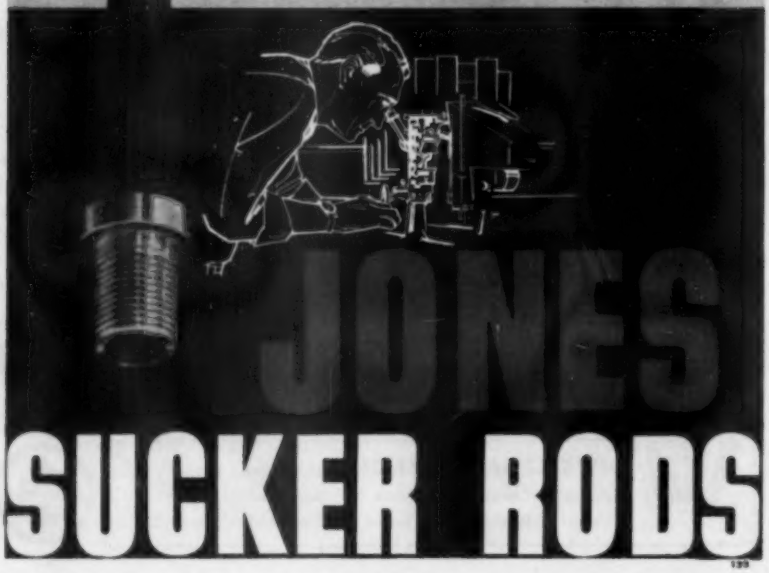
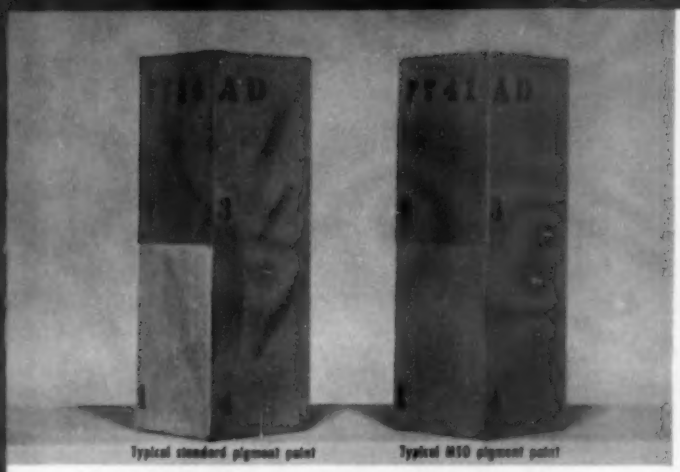
Division of Buffalo Eclipse Corporation
General Office and Factory: TOLEDO, OHIO
Sales Office: Enterprise Building, TULSA, OKLAHOMA
Export Department: The S. M. Jones Company





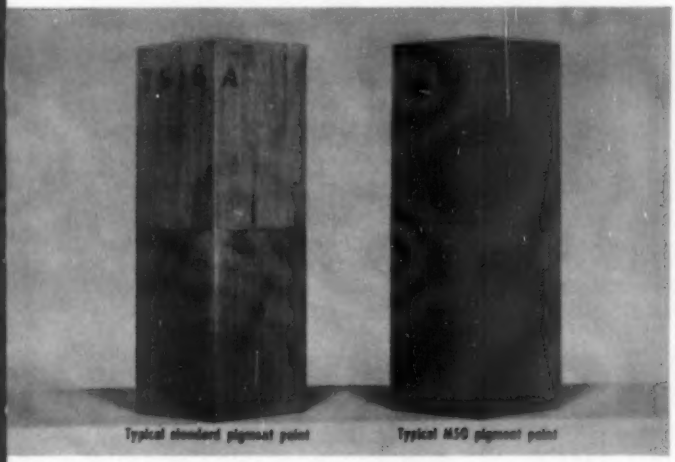
Typical standard pigment paint | Typical M50 pigment paint

No objectionable whitening from chalking

Contrast these two exposure test panels . . . both show comparable metal finish paints. Same original colors. Same exposure (45° South, 2 yrs., 3 mos.). Notice bright color of *M50* paint, freedom from chalk.

No appreciable fading from light action

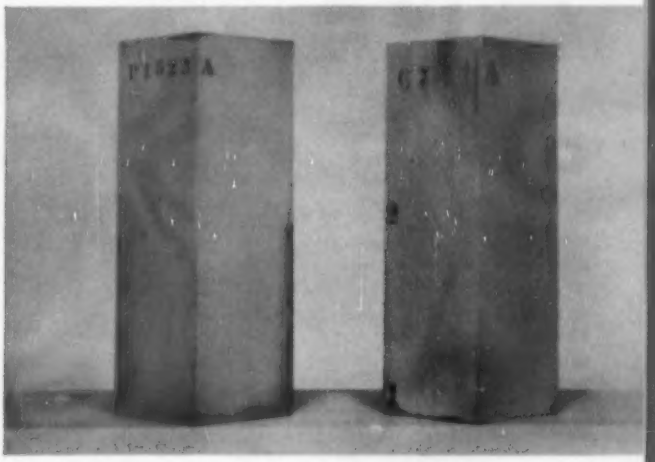
Now look at this 9-year exposure test panel of an *M50* paint. Contrast area shaded by wooden panel holder with non-shaded area. Clearly, there has been practically no fading in this 9-year period.



Typical standard pigment paint | Typical M50 pigment paint

No leaching from water action

Examine the exposure panel at left. Notice the vertical brushmarks? Rain water leaching of the top coat permits brushmarks in undercoat to show through. In the panel at right, insoluble *M50* pigment prevents this film failure. Exposure 45° South, 2 yrs., 7 mos.



No discoloration in industrial atmosphere

Here are two exposure panels painted from the same can of *M50* paint. Both have been exposed 4 years, 45° South. The right one in normal atmosphere, the other in sulfur-laden industrial atmosphere. Notice no color difference has developed. No bilging.

Proof you get unique color stability in metal protective paints made with M50® pigment

Drilling equipment looks better, needs less maintenance painting when painted with colorful *M50* anti-corrosion paints.

No need to amplify what the four illustrations above show. Plainly, *M50* basic lead silico chromate pigment permits your paint supplier to make paints with more color stability than ever before available in anti-corrosion paints . . . primers as well as finishes.

National Lead exposure tests demonstrate that these paints . . . both standard and deep-coat . . . also provide better and longer lasting anti-corrosion action, and never-before weather resistance. Some of the opportunities these new *M50* paints present are suggested on the following page. You'll think of others.

M50 an **oncor** *pigment development of*

National Lead Company

111 Broadway, New York 6, N. Y.

Public relations.
Attractive tank farms that *stay* attractive longer.

Product identification.
Color-coded drums that *stay* colorful longer.

Two ways to make good use of the superior color stability of M50 pigment anti-corrosion paints

Before the advent of *M50* pigment, those responsible for maintenance painting had to make a choice between colorful appearance and long-lasting corrosion protection.

With *M50* pigment paints, exposure experience proves, this compromise is no longer necessary. *M50* paints have weather resistance . . . stay bright and colorful . . . and *at the same time* provide superior corrosion protection. With these unusual paints, color stability problems . . . leaching, fading, whitening, darkening from bilging . . . are eliminated. Now, with *M50* paints, you can have maximum anti-corrosion, maximum durability and, at the same time, long-lasting good appearance.

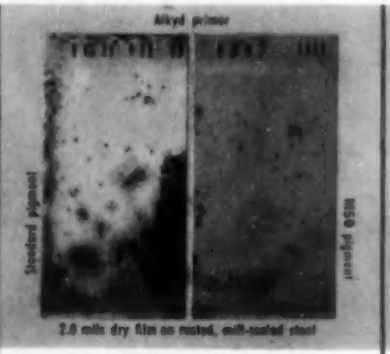
The illustrations above suggest two areas in which the combination of superior anti-corrosion action and superior color stability found in *M50* pigment paints can pay off handsomely. Note that in both, service is severe and colorful colors are needed. With *M50* paints, you repaint less often.

In your own operations there are bound to be many similar applications where specification of *M50* paints can lower your maintenance painting costs. Ask your regular paint supplier to make up suitable *M50* paints for your requirements.

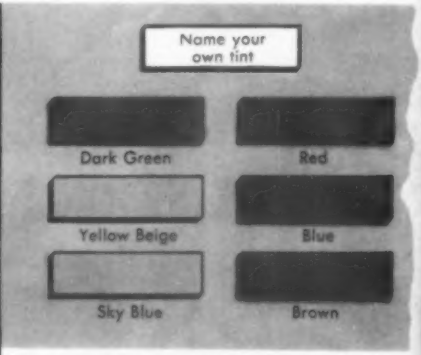
Why M50 Defense in Depth paints give anti-corrosion beyond all former concepts

1 standard pigment alkyd primer coat
2 standard pigment alkyd primer coats
Gray Alkyd Finish Coat
1 M50 pigment alkyd primer coat
2 M50 pigment alkyd primer coats

Exposed 9 years, 45°S. Each coat 1.5 mils
Proved corrosion and weather resistance



Exposed 45°S, 1 yr ind. atmos., 1 yr normal atmos.
Proved outstanding for film strength, durability



Colors above available in conventional and heavy-coat paints
A wide range of stable colors can be produced

Are you concerned with tank or structure maintenance painting in your firm? If so, you are invited: (1) to visit National Lead's Sayville, L.I. test station, where you will see the results of the 20 years research that lies behind the *M50* pigment particle and the more than 10 years of exposure testing that lies behind *M50* pigment Defense in Depth paints; (2) to send coupon below for National Lead booklet, "Defense in Depth" and typical *M50* tank paint specifications.

Next time you purchase, specify *M50* pigment paints. Any paint manufacturer can supply you.

M50 Defense in Depth

National Lead Company,
111 Broadway, New York 6, N. Y.

Gentlemen: Please send me the "Defense in Depth" booklet together with typical tank paint formulas and color chips that I can use in specifying M50-type tank paints.

oncor

Name_____ Title_____

Firm or Dept._____

Address_____

City_____ State_____

accept orders except through licensed distributors."

In addition to the inventory and licensing provisions, McWilliams said, there should be: (1) an agreement on the total number of distributors to handle the line, (2) a fair margin of profit for the distributor, (3) a guarantee from the distributor that he will maintain the price structure on the product, and (4) a commitment by the distributor that he would not take on competitive lines.

There is wide disagreement on whether exclusive franchises should be granted, with the majority of suppliers opposed.

Some feel that exclusive franchises might be practical "in a limited way" for some particular types of equipment that require large inventory investments and specialized sales activity. But most of the suppliers tend to discount the desirability of exclusive arrangements for reasons much like that given by OCT's Jones:

"With an exclusive franchise distributor, the manufacturer is tied directly to the supply store's customers and would probably still have to maintain a sales force to some degree for technical assistance."

Failing's Godschalk added:

"Exclusive franchises tend to lessen the sales effort of a distributor."

There is one point, however, on which all suppliers seem to agree—the supply business is changing and, for better or worse, the methods of doing business will have to change with it.

This viewpoint is perhaps best summarized by statements from executives of two large supply companies, both tinged with regret but frankly realistic:

"The supply store has lost its early flavor, when it was the social hall, the hiring hall, and the news center in the oil boomtown. Now it is just a straight out-and-out point of supply.

"The buying isn't done as much by the pusher and the driller. The operators are getting more engineers into the field, doing more buying at the district, division, or main office . . ."

"One of the most damaging factors in the supply industry has been the increase in manufacturers' warehouses away from their plants. . . The best thing that could happen to the supply industry would be the complete elimination of manufacturers' field stocks.

"The supply companies then would have to do the job they're supposed to do—be the warehousemen for the oil industry. And those who were not willing or able to do so would be eliminated."

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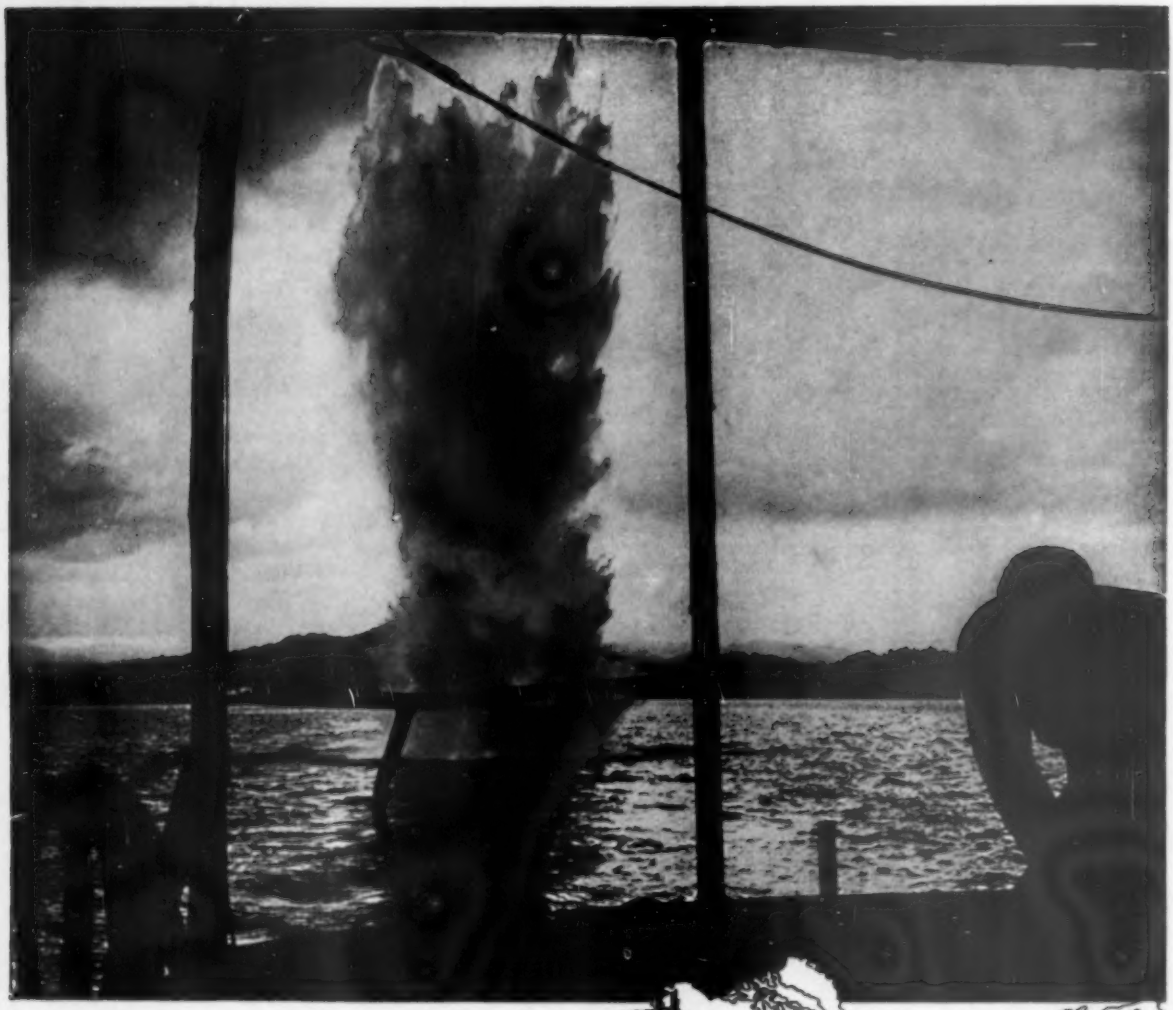

Western Conducts More Marine Seismic Surveys Than All Other Contractors Combined!

Every year since 1954, Western Geophysical Company boats have done well over half of ALL contract offshore seismic explorations in the world.

This record reflects the considered judgment of many of the most respected people in the petroleum industry on the competence of Western men, techniques and instrumentation. When you consider your next geophysical survey, let us tell you more about the Western services that have earned and held such confidence.

Additionally,
Western's land seismic parties and gravity crews are at work on four continents.

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AFFILIATE AND REGIONAL OFFICES THROUGHOUT THE WORLD

In waterfloods . . .

Microbiology Can Pinpoint Corrosion

Look for microbiology to play an increasingly important role in solving corrosion problems in waterflood operations.

The full implications of microbiological corrosion in waterfloods have scarcely been touched, reports J. M. Sharpley, chief microbiologist, petroleum section, Buckman Laboratories, Memphis, Tenn.

Generally, he said, only superficial examinations of operating waterfloods have been made, and only the simplest of culture techniques have been used, to hunt bacteria responsible for corrosion.

If bacteria did not grow in these simple tests, he said, the possibility of bacterial corrosion was ignored.

It was this point—a better means of bacteriological examination—that Sharpley emphasized as being the key to establishing the presence of corrosion-causing bacteria.

Sharpley's remarks were made recently before the conference of the National Assn. of Corrosion Engineers, South Central Region, in Tulsa.

One development cited as essential to increased usefulness of microbiology is a means for detecting microorgansims having the ability to grow on surfaces such as pipe and equipment.

This method, Sharpley said, appears to give a more direct measurement of potential corrosiveness of a given bacterial population than has been available previously.

This method—the submerged slide technique—overcomes the difficulty found in artificially culturing this type of bacteria.

The technique utilizes a glass microscope slide submerged in the water supply. The slide may be installed and used in much the same manner as a corrosion coupon.

A diverted sidestream, he added, such as originally proposed for corrosion testing by the Bureau of Mines, has proved very useful in this method.

Use of the submerged-slide method in California's Wilmington field, for example, gave a much clearer picture of the bacterial population and helped trace corrosion cause.

In Wilmington, where water from the Gaspur zone was being used, lines and equipment were perforated with pit corrosion typical of microbiological attack.

Waterfloods treated with bactericides had less corrosion, Sharpley reported. Yet with all of this operational evidence of microbiological corrosion, few bacteria could be demonstrated by routine culture techniques.

When a submerged slide technique was used, however, he said, an entirely different picture was obtained.

Small slime masses formed on the surface of the glass within 48 hours. When these bacteria were examined, they were found to possess very large capsules.

Thus, Sharpley said, the mechanism of corrosion in this installation is now somewhat clarified.

It appears almost certain that sulfate-reducing bacteria are active under slime masses of other bacteria.

In the Wilmington case, the sulfate-reducing bacteria weren't dislodged in sufficient numbers to provide high counts when cultured in routine methods.

(Sulfate-reducing bacteria are generally accepted as causing microbiological corrosion through the activity of an enzyme—hydrogenase—which allows utilization of elemental hydrogen from the cathodic side of the corrosion cell and acts as a biological catalyst in allowing the hydrogen to reduce the sulfate. Thus, oxygen from the sulfate is made available for the cathodic process and corrosion continues.)

In addition, iron bacteria, which hadn't even been indicated with routine culture methods, were causing corrosion.

None of these, Sharpley said, could have been clarified without the use of submerged slide techniques and direct microscopic examination.

The quantitative measurement of such bacterial deposits offers some difficulties, Sharpley said.

The most practical field technique, he reported, is to count the bacteria present on the surface of the slide and report them on a basis of bacteria per square unit of measurement.

Here's How One Salt Dome Field Looks

Shell Oil Co. employees in the New Orleans area office built this three-dimensional model of Eugene Island Block 188 salt dome field—scale of 1 in. to 1,000 ft.—to make it easier to forecast other details not known in those areas of the field where little or no drilling has been done. The dome was fabricated by molding plaster of paris, using a contoured map of the dome to 12,000 ft. as a guide. Productive strata are represented by layers of lucite bent and cut to scale to true shape. Updip accumulations of oil and gas are shown in red and green.

Clear plastic broom straws represent wellbores.

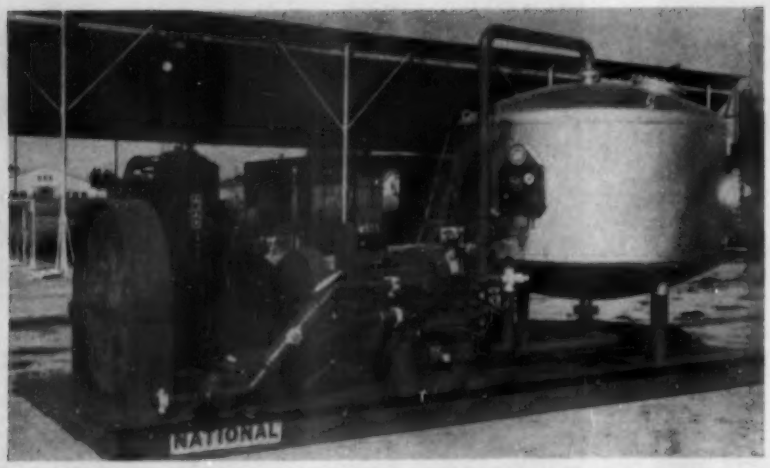
ALCOA makes Pipeline History on First Underwater Completion Well!

...with one and a quarter miles of light, strong Alcoa Aluminum Pipe flexible enough for launching in heavy surf and sweeping crosscurrents

The flexibility, light weight and outstanding corrosion resistance of ALCOA® Aluminum Pipe made important contributions to the success of the world's first underwater ocean oil well completion by Peruvian Pacific Petroleum Co. □ Located on the ocean bottom, 132 feet down, the wellhead is 6,200 feet from shore. Its flow system is Schedule 40 aluminum pipe—a 3-in. flow line and a ½-in. hydraulic valve control line. □ Peruvian Pacific, a subsidiary of Cities Service Co., as operator in the joint venture with Richfield Oil Co., had good reason to select aluminum. With the wellhead on the bottom, submarine pipelining was called for. That demands pipe with superior corrosion resistance. ALCOA Aluminum Pipe has it—with no need for costly coatings or wrappings. □ Just as important, since the pipe was to be launched in one continuous length through heaving surf and strong sea currents, it had to be flexible enough to roll with the punch. Aluminum's favorable modulus of elasticity gives just that kind of flexibility. □ Illustrated at right are frames from a new motion picture showing this historic piping operation . . . job-site storage of the specially fabricated 50-ft pipe sections . . . welding into continuous lengths . . . bundling of the two pipe sizes . . . stringing down the beach . . . launching through pounding surf and racing currents in which the pipelines were deflected by hundreds of feet without rupture. □ The complete film of this exciting operation will be shown by ALCOA at the Chicago meetings of API. Be sure to contact an ALCOA representative there. He'll gladly arrange for you to see the film. □ A paper detailing the Peruvian Pacific operation will shortly be published. To reserve a copy, write ALUMINUM COMPANY OF AMERICA, 873-L Alcoa Building, Pittsburgh 19, Pa. □ World-wide sales through ALCOA INTERNATIONAL, INC., 230 Park Avenue, New York 17, N. Y.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA



SIDE VIEW of packaged waterflood unit shows engine and pump arrangement. This . . .

Waterflood Unit Uses One Engine

National Supply Co. has come out with a packaged waterflood unit that is fueled by gas and uses a single prime mover to operate all three of its pumps.

The unit is skid-mounted and is designed for water filtration and supply for floods having water requirements of from 1,530 to 4,480 b/d. Working pressures are from 560 to 1,645 psi.

It measures 20 ft. by 9½ ft., weighs 18,500 lb., and was fabricated in Tulsa by Deckard Mfg. Co.

Unit costs range from $13,200 to approximately $14,000, depending primarily on the type and size of filtration equipment selected.

The unit will be built to order "until we see what the demand will be," National says. All component parts are carried as standard stock.

Pump motivation with only one prime mover is effected through a combination driveshaft direct hookup and V-belt transmission system.

The prime mover is an Ajax DP-60 9½ x 12-in. single-cylinder, two-cycle gas engine. The injection pump, which is directly connected to the engine, is a National J-50 Triplex.

Backwash and filter pumps, both of the centrifugal type, are driven by Poly-V-Belts from engine and pump shaft extensions.

Both the backwash and filter pumps operate during injection.

During normal operation, the filter pump continuously transfers filtered water to a clear tank. A bypass on the filter pump regulates capacity, to keep the amount of filtered water approximately equal to the amount injected.

This bypass valve is fully opened during backwashing of the filter.

The backwash pump charges to the suction of the triplex pump during injection periods. When backwashing is required, a bypass on the injection pump discharge is opened so that flow from the backwash pump is directed through the filter.

A differential pressure gauge determines when the filter should be backwashed.

Backwashing on the unit is manual, but it can be automated by adding a gas-operated valve activated by a differential pressure switch.

The unit has a pulsation damper installed directly below the suction valves as an integral part, rather than the conventional placement on the suction line.

Because of its location, the suction damper removes pulses at their source and allows fluid to enter the pump in a placid state.

This assures complete filling of plunger chambers and gives greater pump efficiency. A discharge damper also is included.

Also included on the unit is an 8 x 3½-ft. permeable plate-type filter tank, a butterfly valve type manifold, requisite interconnecting piping, and safety controls.

A gas engine was chosen over an electric motor as the prime mover because of the cost advantage in cheap gas areas.

The first unit has been bought for use in a West Texas area where it will be fueled with field gas.

Even when gas must be bought, it appears to be a more economical fuel for 24-hour operation, National says.

Gas does not, of course, lend itself as well to cycling operations as does electricity.

Noisy Seismic Records Stilled

Marine seismic records that were useless because of resonance problems—"singing"—are being processed into useful record sections through a new system.

This development was disclosed last week by Carl Savit, director of systems research for Western Geophysical Co., in a report to three trade associations meeting jointly in Los Angeles.

The groups involved were the Pacific Sections of the American Assn. of Petroleum Geologists, The Society of Exploration Geophysicists, and the Society of Economic Paleontologists & Mineralogists.

Savit pointed out that the characteristics of "singing" records vary so widely from what they theoretically should be, that only by empirical trace-by-trace analysis and corresponding treatment could a system have the degree of flexibility necessary to make it commercially practical.

The new method, called the Frequential Resonance Rejector System, also takes into account any differences in the characteristics of reflected energy.

This permits retention of a maximum of valid reflection signal, Savit said.

He also noted that singing, or resonance, has been found which is as much as 100 times as strong as the reflection signal itself.

"At least 100-to-1 suppression of individual frequencies thus becomes necessary," he added. "Western's research over a period of several years has demonstrated that only with frequency-domain filtering could such a degree of suppression be obtained."

The new method utilizes a battery of 40 one-cycle-wide, band-reject filters to suppress the singing signals recorded on magnetic tape.

The step-by-step analysis of one trace at a time determines the frequencies present in the resonance, as well as those which must be preserved to retain reflections.

Finally, Savit continued, a group of filters in cascade is chosen to optimize the signal-to-noise ratio. Original tapes are than played back through the specially chosen filter combinations to produce final usable records and record sections.

No re-recording of original tapes is required by the frequency sequential resonance rejection system, Savit told the meeting.

ELECTRONIC MUD-COST ANALYSIS

Another Milwhite Aid to Decreased Drilling Costs

Customer service in all phases of Milwhite operations is graphically illustrated in the above photographs. Invoices are prepared daily to facilitate the accounting work of Milwhite customers in maintaining accurate and current cost records on all new wells. Utilizing information from invoices, Milwhite is electronically preparing Mud Cost Analysis reports on each and every well serviced. Through a special numbering system, well locations are pinpointed by counties or parishes. In furnishing information for cost estimates for future drilling in the same area, the records quickly provide information on all products used previously on wells in the area and complete historical cost information. Soon, mud cost records and the complete engineering report for each well will be microfilmed and united in one card to provide a complete history of each well drilled in one readily accessible reference. These records, with the specific approval of the operator of each well drilled, will allow drilling operators to more accurately estimate future well costs for proposed locations in the same area. Complete cost analysis records will be provided in multiple copies on all wells serviced on completion of the well rather than the present manually prepared records on request. Just one more step in Milwhite's continuing program to provide the best, complete service.

MILWHITE

MUD SALES COMPANY

HOUSTON, TEXAS

DIVISION OF MISSISSIPPI RIVER FUEL CORPORATION

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Shell to Start Pilot Steam Flood in California

Shell Oil Co. soon will initiate a pilot test in Coalinga field, Fresno County, Calif., to steam heat an oil zone.

The company hopes the steam will reduce viscosity of the 15-gravity crude so that it will flow, thereby increasing production. A zone known as the 1st zone, at about 1,000 ft., has been selected for the test.

Shell will attempt to force oil around an input well toward other wells. The injection well will be drilled late this month. Shell hopes to begin steam injection around mid-December.

The Coalinga steam flood reportedly will be of a type similar to one Shell started some months ago at Yorba Linda, Orange County, where a zone producing 12-gravity crude from approximately 600 ft. is being steam-heated (PW—Jan.24'60,p59).

•

University of Texas Plans Lease Sale

The University of Texas may hold a sale of oil and gas leases in March, 1961.

Bill Allcorn, chairman of the Board for Lease of University Lands, said decision to hold a sale will depend upon "quantity and quality of tracts requested" by Dec. 8.

The tracts leased on Nov. 29, 1955, also will be available to new leasing, at the proposed sale, due to expiration of the five-year term, the board reported.

•

Oil and gas leases to more than 41,500 acres will go up for auction sale Nov. 30 and Dec. 1 by the State Land Dept. and the Bank of North Dakota.

The Land Dept. sale on Nov. 30 includes 197 tracts, covering 28,814 acres, in 13 counties. The bank sale on Dec. 1 includes 189 tracts, totaling 16,738 acres, in 12 counties.

•

The former owners of Renwar Oil Corp., recently acquired by Tennessee Gas Transmission Co., have formed Palm Petroleum Corp. to continue in exploration and production.

Roland S. Bond, Dallas, former Renwar president, will head the $2.2-million corporation as chairman. Offices will be maintained in Dallas, with operations based at Corpus Christi under direction of President William V. Byrd, former Renwar vice-president.

•

Fred Whitaker, a Carthage (Tex.) independent, has acquired the oil and gas production holdings of F. R. Jackson in two North Louisiana fields and one in East Texas.

Properties involved in the more than $500,000 transaction are Jackson's quarter interest in two 640-acre gas units in North Henderson field, Rusk County, Tex., full working interest in three oil wells in French Fork field, LaSalle Parish, La., and an unspecified interest in one gas unit in Sugar Creek field, Claiborne Parish, La.

•

More than 70,800 acres of federal oil and gas leases were awarded last week in Salt Lake City.

There were more than 3,000 applications for the lands, representing acreage on which leases had expired or been canceled. The total was termed the largest "simultaneous" filing in the history of the Salt Lake federal land office.

The drawing was effected by pulling application slips out of a cardboard box. Most filings were by individuals.

•

Utah's Oil & Gas Conservation Commission has set the natural gas allowable at 200,000 cf/d per oil well in the Greater Aneth area.

The allowable continues the basic increase order set two months ago in the hope of stimulating output per well at Aneth. Commission figures for nine months this year, however, show that output this year will be some 2-million bbl. less than in 1959—principally because of declines at Greater Aneth area.

•

California's State Lands Commission will decide next week whether to offer four blocks of offshore land in the Santa Barbara area to simultaneous bidding or to offer each parcel separately.

The commission met in Los Angeles in late October but deferred its decision to a Nov. 15 meeting in Sacramento. Each of the blocks contains 4,250 acres and none is within the known geologic structure of any producing oil or gas field.

•

Welex, Inc., is to become a division of Halliburton Co. and shift its operations from Ft. Worth, Tex.

Halliburton acquired Welex in 1957. General offices of Welex are to be moved to Houston at the end of the year.

•

Star Perforators, Inc., Ft. Worth, Tex., has acquired GO Oil Well Services, Inc., and changed its corporate name to GO, Inc.

GO will operate all equipment and facilities formerly operated by Star Perforators and GO Oil Well Service at Alice, Corpus Christi, and Houston.

•

East Texas' first plant for the recovery of sulfur from natural gas has gone into operation in Franklin County's New Hope field.

The plant is a unit project operated by Tidewater Oil Co., holder of a 43% interest. Remaining substantial

Open Barite Vein Found in Montana

The Montana State Bureau of Mines & Geology reports existence of a vein of barite, near Eureka, which is open to commercial development.

Uuno M. Sahinen, chief geologist, says the barite vein is exposed on the west flank of Tobacco River Valley, Lincoln County, in section 6-35n-26w.

Sahinen reports one vein sample for quality was found to contain more than 90% barium sulfate.

FOR FACTS ABOUT

Canada's Oil and Gas

A. D. Insley, Manager of the Royal Bank's Oil and Gas Department, gets close up view of drilling operation.

The Royal Bank of Canada provides complete banking services to Oil and Gas men. Over 300 branches are strategically located throughout the Oil and Gas areas of Western Canada. Each Manager knows his own district intimately, can provide on-the-spot service and information because he works there. The Bank's Oil and Gas Department, Calgary, issues from time to time timely "Bulletins" dealing with many aspects of the Oil and Gas business in Canada. For a list of current "Bulletins" write—The Royal Bank of Canada, Oil & Gas Department, 409 8th Avenue West, Calgary, Alta.

We do not provide information on oil securities.

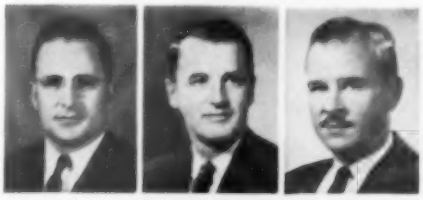
THE ROYAL BANK OF CANADA

Canada's Oil and Gas Bank

Over 1000 branches in Canada, the Caribbean area and South America
Offices in New York, London, Paris

Assets exceed 4 billion dollars

Meet these men at the A.P.I. Convention: If you are interested, even casually, in Canada's Oil and Gas Industry, these men would like to meet you in their suite at the Congress Hotel.



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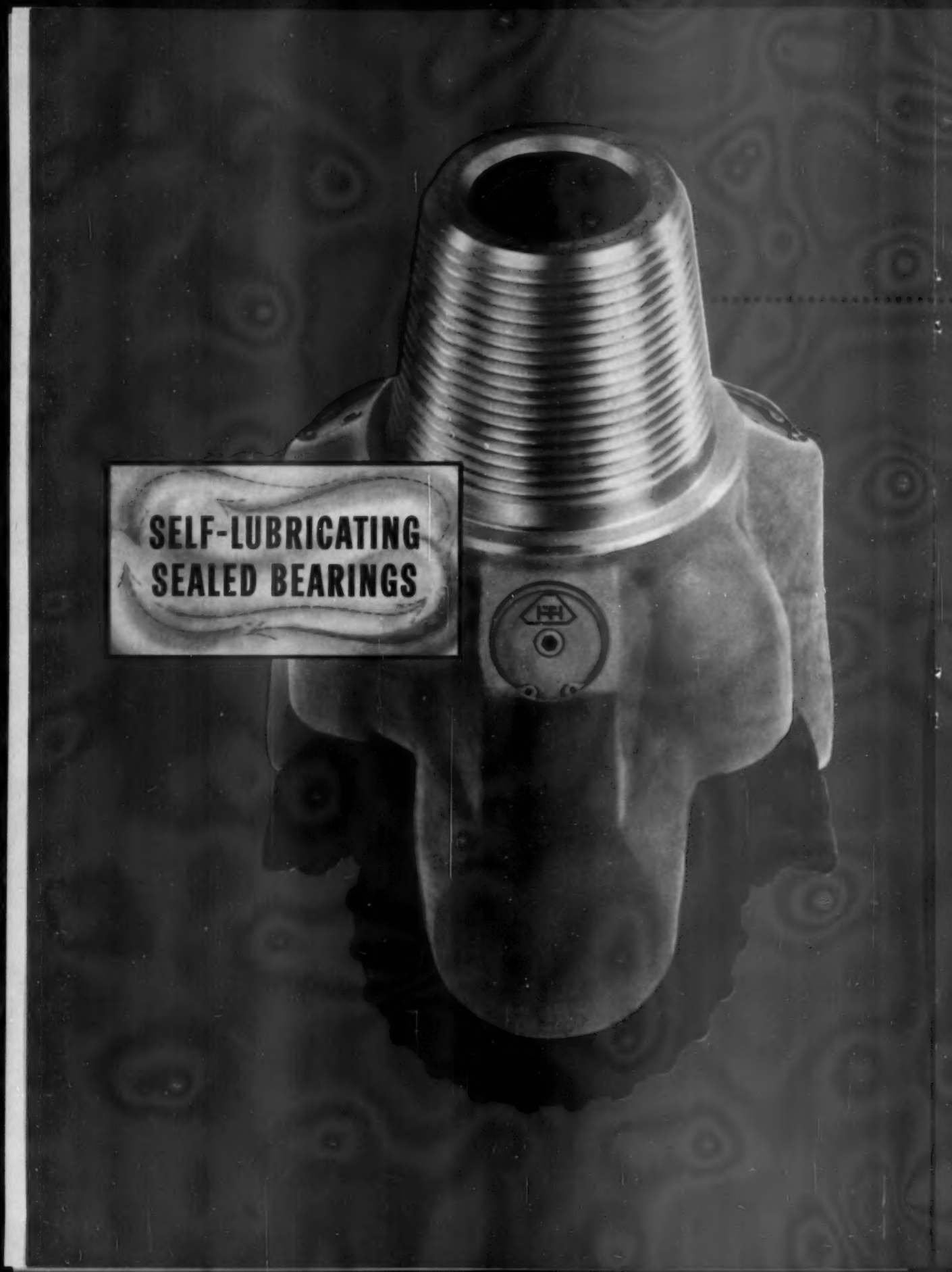

SELF-LUBRICATING
SEALED BEARINGS

Another Major Contribution to Rotary Drilling by Hughes

The *self-lubricating* Sealed Bearing bits coming off the production line at Hughes represent the most important breakthrough in rock bit design since the introduction of the Hughes-type bit.

By greatly increasing the footage drilled per bit, the *self-lubricating* Sealed Bearings are making possible further major savings in round-trip time.

Demand for these history-making bits is still far in excess of supply . . . even in face of rising production.

Development of the *self-lubricating* Sealed Bearing bits proves that you can always look to Hughes for the most advanced rock bit designs.

HUGHES TOOL COMPANY

ORIGINATOR AND WORLD'S LEADING DEVELOPER OF COMPANY ROCK BITS

ALL...or any part

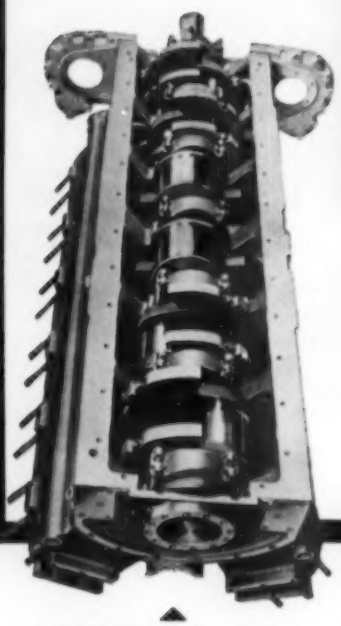
WAUKESHAS

are your *finest*

OIL FIELD ENGINES

(Diesel . . . LP Gas . . . Natural Gas)

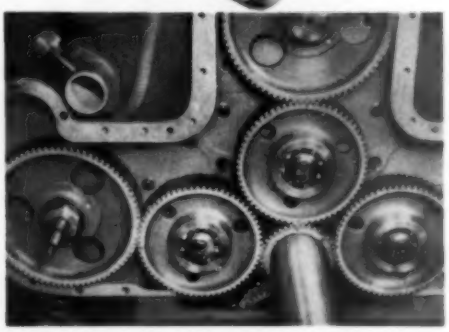
- **Favorites for Over 40 Years**
- **Rugged Construction • Precision Machining**
- **Balanced Assemblies • Modern Design**
- **Quality Control of Materials, Assembly, Testing**



Crankshaft and main bearings in place in a typical Waukesha V-12 oil field engine. Note heavy flanges, thick bearing webs, rugged long-life construction.

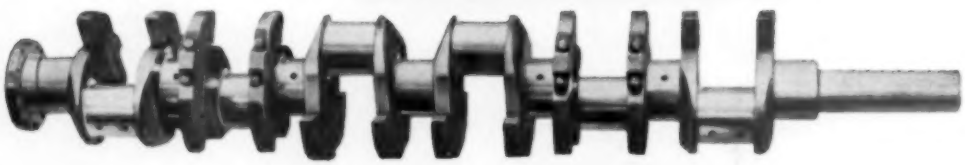
Precision-built and balanced rod assemblies, matched with pistons. Pressure oiled, mirror smooth, heavy pins. Replaceable bearing shells.

Removable wet cylinder sleeves of close-grained alloy iron, finished for oil retention and long life. Heavy duty, aluminum alloy, oil-cooled pistons.



Wide-faced helical cut timing gears are flood oiled. Materials selected for long, quiet life and accuracy. Gears and all elements in the power train, from pistons to flywheel, are precision-machined in Waukesha shops under Waukesha Quality Control.

Rifle-drilled, drop-forged, heat-treated crankshafts, precision-ground to exacting Quality Control standards. Note extra large bearing areas. Statically and dynamically balanced.



503

SEND FOR BULLETINS

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN / **New York • Tulsa • Los Angeles**

Factories: Waukesha, Wisconsin and Clinton, Iowa

interest is held by Texaco Inc. The installation has a cycle capacity of 50-million cf/d. Daily recovery includes 323,000 gal. of gas liquids and 220 tons of sulfur.

•

The Offshore Co. has purchased two more deep-water drilling platforms from DeLong Corp.

Offshore now owns and operates five DeLong platforms in addition to 18 other units. A company spokesman said the new purchase makes Offshore the owner and operator of the largest fleet of deep-water mobile drilling units.

•

Engineering

A new line of slip-suspension tubing heads for low-pressure use has been introduced by Larkin Packer Co., Inc.

The Type H., with male connection only, is rated at 500 psi. working pressure. The Type Q, with female connection only, is rated at 750 psi. working pressure.

The new tubing heads are full opening in all sizes, which range from 2-in. tubing through 7-in., outside diameter, casing.

•

Drilling Highlights

New Mexico—El Paso Natural Gas Co. No. 1 Lusk Deep Unit, section 19-19s-32e, Lea County, a dual discovery, was completed for 732 b/d of 50-gravity oil through ¼-in. choke and perforations at 11,168-93 ft. in the Strawn, and flowed 5 bbl. of oil per hour through ¼-in. choke and perforations at 8,759-77 ft. in the Bone Spring. The well is ½ mi. northeast of Lusk Delaware pool.

Oklahoma—Marion Oil Co. No. No. 1-A Valtr, section 30-20n-5w, Garfield County, was completed for 920 b/d of 39-gravity oil through 20/64-in. choke and fractured open hole section at 6,438-526 ft. in the Meramec. The wildcat is 2½ mi. northeast of East Hennessey pool in Kingfisher County.

In Cleveland County, Herman Brown No. 1 Kunkler, section 24-9n-1w, was dually completed for 195 b/d of 36-gravity through 12/64-in. choke and perforations at 6,748-58 ft. in the Second Wilcox, and for 240 b/d of 36-gravity oil through 10/64-in. choke and perforations at 7,419-30 ft. in the Oil Creek. The discovery is 1½ mi. northeast of East Falls pool.

East Texas—Humble division of Humble Oil & Refining Co. No. 1-I South Chandler Oil Unit, Eli Hillhouse survey, Henderson County, former Gloyd (Rodessa) oil and gas producer, was completed for 324 b/d of 49-gravity oil through 12/64-in. choke and perforations at 9,376-82 ft. in the Hill zone, a new pay, of the Rodessa. The well is in the one-well South Chandler pool.

In Van Zandt County, Humble No. 1 W. K. Savage, Josiah Walker survey, recovered 1,200 ft. of 47-gravity oil on ½-hour drillstem test at 8,230-45 ft. in the Rodessa. Nearest production is 7 mi. southwest in Southeast Fruitvale (Rodessa) field.

Alberta—British American Oil Co. Ltd. No. 6-6 Richards Stettler, lsd 6-6-37-20w4, flowed oil at the rate of 21 bbl. per hour on drillstem test at 5,332-50 ft. in the Nisku. The test, which is projected to the Beaverhill Lake formation, is 2½ mi. west of Nisku production at Fenn-Big Valley.

South Louisiana—Tennessee Gas Transmission Co. No. 1-A Luke Detraz, section 17-13s-3e, Vermilion Parish, was completed for 4.9-million cf/d of gas and 192 b/d of condensate through 12/64-in. choke and perforations at 14,717-32 ft. in the Abbeville sand. The wildcat is 2 mi. south of Perry Point field.

If by land . . . if by sea

Whatever the size of your enterprise and wherever it may be, the Whitney stands always ready with facilities for financing the exploration, production, refining and marketing of oil and gas resources.

Whitney

NATIONAL BANK OF NEW ORLEANS

Established 1883 • Member F. D. I. C.

Agip Mineraria, S.p.A. Italy • **Antar Pétroles de l'Atlantique** France •

"Aquila" Italy • **Bay Refining Company** Michigan • **Century Refining Company**

Kansas • **Chinese Petroleum Corporation** Formosa • **"Condor"** Italy •

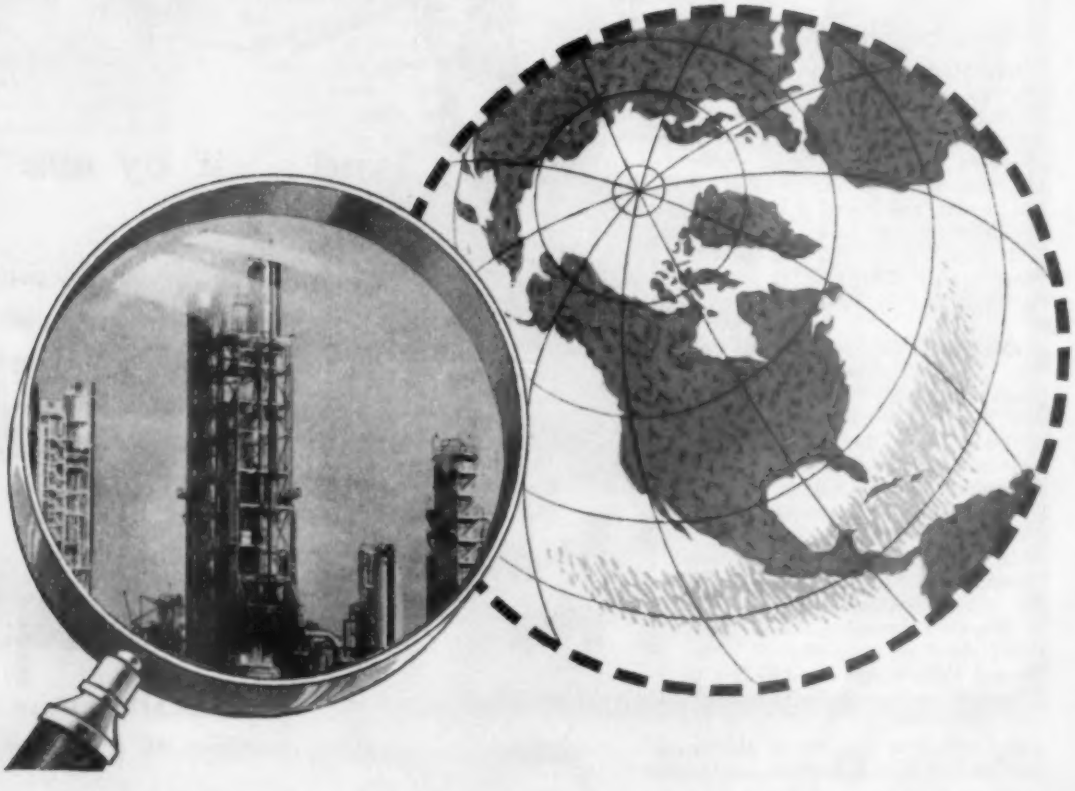
Continental Oil Company Louisiana/New Mexico • **Delhi-Taylor Oil Corporation** Texas •

Delta Refining Company Tennessee • **Derby Refining Company** Kansas •

Deutsche Erdol, A.G. Germany • **Gelsenberg Benzin, A.G.** Germany •

Great Northern Oil Company Minnesota • **Neste, OY** Finland •

IN 13 COUNTRIES...



"Petrofina," S.A. Texas/Italy • **Petróleos Mexicanos** Mexico • **Phillips Petroleum Company** Oklahoma/Utah • **Pontiac Eastern Corporation** Mississippi • **Ruhrchemie, A.G.** Germany • **Sacor** Portugal • **Shamrock Oil and Gas Corporation** Texas • **Signal Oil and Gas Company** California • **Société Chérifienne des Pétroles** Morocco • **Standard Oil Company (Ohio)** Ohio • **Standard-Vacuum Oil Company** Australia/Philippines • **Turkiye Petrolleri Anonim Ortakligi** Turkey • **"União"** Brazil • **Vickers Petroleum Company** Kansas

30 COMPANIES

are saving money with Airlift TCC

Construction costs on Socony Mobil's Airlift Thermofor Catalytic Cracking units have been cut almost in half during the past ten years—a result of continuing Mobil research.

Operating costs have also been reduced. Three years ago Mobil introduced the Durabead catalyst, opening new money-saving horizons in TCC operation. Today's improved Heavy Durabead catalyst brings still greater economies.

Around the world, 51 Airlift TCC units are turning oil into money for 30 companies. Thirty-five of these units are operated under license from Socony Mobil by the 29 companies listed above. Two more units are now under construction, in Mexico and the Philippines. Mobil, itself, brings the company total to 30. Mobil has installed 16 Airlift TCC's in its own refineries in the United States and Europe.

For any refiner interested in the TCC, Mobil will help work out the best processing procedures and cracking yield patterns for a given crude. Address inquiries to Process Promotion Department, Socony Mobil Oil Company, Inc., 150 East 42nd Street, New York 17, N. Y.

SOCONY MOBIL OIL COMPANY, INC.

Leader in Refining Research

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Service Stations: Big Changes Coming

For more than 35 years, service stations have shown no basic variations. But now new factors have emerged to force marketers to re-evaluate station design.

Service stations are on the verge of unprecedented change. A host of factors in oil marketing have emerged to reshape everything from pumps to lubrication bays.

Here are some of the influences oil marketers will have to consider during the next five years, as they redesign their stations:

- The intensification of competition and the narrowing of profit margins, calling for increased emphasis on efficiency at stations.
- The emergence of the greaseless bearing and the threat of a service-free car, both throwing a cloud of doubt over the future of the lube bay.
- The growing consumer preference for one-stop shopping, as testified to by the success of shopping centers and the expansion of supermarkets into a broadening line of nonfood products.
- The increasing interest of city planners and local groups in the question of service station design.
- The full-scale reorganizations of several major oil marketers, which have brought forth a need for new service station designs to represent unified marketing systems.
- Technology advances that promise to revolutionize the dispensing of gasoline.
- The growing cost of modernization (table, page 64), which is causing many marketers to give more favorable attention to complete rebuilding of service stations when they become obsolete.

Lube Bays Lose Face

The part of the service station that will be most vulnerable to change is the lube bay. Long criticized for its ugliness, the bay may soon be relegated to the back of the station.

Back-opening bays not only rid the station facade of the gaping holes that irritate designers, but they also free the front of the station for more attractive architectural features or product displays. In addition, by diverting lube-bay traffic to the rear of the station, designers lessen the congestion around the pump islands and the front of the station.

Standard Oil Co. (Ind.) has been among the leaders in shifting lube bays to the rear. R. A. Niles, manager of operations and engineering, believes that the company already has 100 stations with back-opening bays. (Five years ago, the company had none.) Furthermore, Niles says, there are increasing demands from Standard's regional executives for such stations.

Back-opening bays may be used nationwide by Standard. One of the designs the company is considering for use in its reorganized marketing system features such bays.

SINCE 1934, when Texaco introduced it, this design has been used throughout the industry without fundamental change.

There are two other ways of ridding the station facade of the ugliness of lubrication bays. One is to camouflage the bays behind a fence, which is being tried by DX Sunray Oil Co. at an experimental station in Tulsa. The other is to shift the bays to the side of the station, which has been tried by Phillips Petroleum Co., among others (picture page 64).

A third variation on bay location has been suggested by an industrial designer. Instead of housing the lube bay within the main station building, he suggests relegating them to a shed in the rear of the station grounds. The main building, which thus needn't be as large as in most stations, would be left free for the display of tires, batteries or accessories (TBA).

There is one factor that threatens not only the traditional position of lube bays, but their very existence at service stations as well. This is the trend toward the service-free car.

The emergence of the so-called greaseless fittings on today's new cars is the most widely heralded aspect of the service-free car. Indeed, Detroit anticipates that by 1965 every new car will be "greased for life."

But there are many other manifestations of the service-free trend that also deserve attention:

- The number of lubrication points is declining on automobiles.
- No one envisions a sealed-for-life engine, but car manufacturers—particularly Ford Motor Co.—would like to reduce oil changes to two a year.
- The lighter loading of compact cars is expected to increase tire life about 15%.
- The muffler replacement business is in for a reversal: All carmakers are claiming longer life for their mufflers. American Motors has introduced a ceramic coated muffler system which, it says, lasts indefinitely.
- Spark-plug manufacturers currently advocate change every 10,000 mi., but, privately, they concede that in most cases their plugs will last 20,000 mi.

These factors, and many others, point in the direction of a dwindling need for lube bay service.

TODAY, service station design must conform with rapidly changing trends in marketing, construction methods, and fueling systems. Here is a design demonstrating the application of electronic fueling, which obviates conventional pump pedestals.

It will be a few years, however, before this trend actually affects service station design. In the meantime, there may even be an increase in the number of three-bay stations, to say nothing of the continued building of two-bay outlets. There are three reasons:

- High-volume suburban locations have created a need for larger service stations (in many cases replacing smaller, obsolete outlets).
- A few major companies have announced intentions to offer their dealers greater opportunities to expand their sales potential through servicing and car maintenance.
- Long after Detroit is able to manufacture a supposedly service-free car, present automobiles still on the road will continue to require maintenance and inspection.

There may be another reason for building bays: converting them to nonautomotive uses when the demand for car service trails off. This is the explanation of at least one company that is building a large number of three-bay stations.

"If we don't build them now, it will be more costly to add them in the future," says the company's operations and engineering manager.

But when asked about the long-term possibility of a dwindling demand for lube bays, he answers: "When that happens, we'll turn over the space to some professional people to use as offices—doctors' offices, for example."

Another operations executive expressed doubt that a doctor would want to locate in a reconverted lube bay. But the idea of making a service station look like a professional building is not new. Indiana Standard has already built one in St. Louis, (picture, page 64).

Pumps—On the Way Out?

The pump is another service station facility that is undergoing changes. One of the predominant trends in pump design today is the shrinking in size of the pump pedestals and the emergence of the lightless pump.

Three developments have paved the way for the low, lightless pump:

- The increasing use by marketers of lower, brighter lighting fixtures at the pump island.
- The desire of oil marketers to soften the harsh vertical effect that for so long has characterized service stations.
- The growing belief that the pump need not serve as a beacon to attract motorists.

Many marketers feel that the lower pump and island-lighting configurations lend a more pleasing appearance to the service station. Further, the low, lightless pump brings the computer dials down to the eye-level of motorists seated in the lowest of sports cars. And there is another advantage: These pumps are less expensive than their taller, lighted cousins.

There are some major marketers, of course, that still prefer the lighted pump. Basically, they look upon the pump as the focal point of the station, and argue that it must be lighted to attract attention. In many cases, these marketers have followed the trend toward reduced size in pumps, but they have been halted at 51 in. or 52 in., because safety regulations generally do not permit lighted pumps to stand any lower. (Gilbert & Barker Mfg. Co., in contrast, is marketing a 44-in. lightless pump.)

More attention is given today to the shape of gasoline pumps. This is actually a result of the growth of submerged pumping equipment, which now accounts for 28% to 30% of all pump sales.

Submerged pumps, which commonly serve as many as six dispensers, offer certain cost savings over conventional equipment. In addition, they lessen the possibility of vapor lock, which may occur in overheated underground fuel-lines. But the submerged pumps were also designed with pedestal styling in mind.

"During the late 1940s," says L. R. Frazier, sales manager for Tokheim Corp., "when we were doing the engineering and development work on our submerged pump line, we were fully aware not only that this product was

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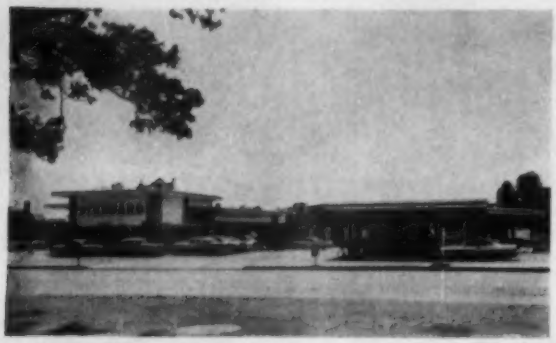


THE PROFESSIONAL BUILDING LOOK is pioneered by Indiana Standard with this split-level station in St. Louis.

LUBE BAYS have been pushed to the side by Phillips in this new design, leaving the front of the station free for displays.

needed to improve the methods of handling fuels, but that it was also the basic requirement in permitting a radical departure in design from what has come to be known as the conventional island dispenser."

Tokheim, itself, has marketed one of these radical departures: its Vanguard Dispensing Pedestal, which has reminded some marketers of a mailbox.

In a different trend, gasoline pumps are being given a broader functional role at service stations. Instead of just dispensing gasoline, the pump pedestals are being made to harmonize with displays of tires, batteries, and accessories at the pump island.

Bennett Pump division of John Wood Co., the company that has gone farthest in this direction, has actually fashioned its pump into a basic building block to which display cases and service units may be added. In its most advanced form, this concept integrates all of the non-repair functions in the service station at the pump.

"We know," explains S. K. Makemson, Bennett vice-president, "that only one out of 20 customers gets away from the pump island and into the station display area; so we rely almost entirely on the personal selling of the individual dealer or driveway salesman."

But since driveway salesmen "do not sell," says Makemson, "there must be some degree of automation in our service station marketing—some degree of motivating and organizing the creation of the desire and willingness to buy, rather than having to depend on the dealer to initiate the sale."

Besides enhancing station appearance and offering improved opportunities for TBA sales, progress in pump construction promises far-reaching changes in station operation and design.

"There are many variations that can be made in gasoline pumps for which the basic design already has been done," says J. A. MacDonnell, vice-president of Gilbert & Barker. He cites four innovations that have recently won the attention of oil marketers:

- "A new device is a presetting mechanism that permits the operator to set the pump for a certain amount of gasoline, such as one, two, three, four, or five dollars' worth, and the pump will accurately deliver this amount and stop without attendance."
- "Ticket printers are being developed that will pro-

continued ▸

What Seven Majors are Spending on Modernization

(dollar figures in thousands; number of stations involved in parentheses)

	Company A	Company B	Company C	Company D	Company E	Company F	Company G
Percent of company's stations being modernized	18%	19%	20%	31%	6%	—	—
Length of program	5 Years	5 Years	6 Months	3 Years	3 Years	5 Years	—
What's being modernized: Facade (incl. doors & windows)	$1,348 (448)	$ 120 (17)	$ 65 (65)	$ — —	$ 30 (10)	$ 700 (100)	$ 2 (2)
Grounds (driveways, etc.)	595 (345)	136 (38)	15 (75)	13 (10)	33 (22)	300 (300)	6 (15)
Exterior lighting	914 (1,967)	— —	60 (300)	114 (22)	100 (83)	240 (400)	16 (20)
Exterior display cabinets	94 (424)	17 (17)	90 (300)	— —	6 (9)	100 (100)	— —
Lube bays added	618 (119)	119 (27)	195 (65)	24 (4)	94 (21)	30 (10)	40 (10)
Lifts added or replaced	316 (410)	390 (533)	175 (250)	13 (16)	23 (35)	100 (100)	8 (10)
Pumps	1,100 (1,384)	1,330 (571)	160 (400)	59 (102)	242 (439)	100 (200)	113 (300)
TOTAL	**$10,298 (2,008)**	**$2,633 (351)**	**$600 (300)**	**$288 (208)**	**$220 (84)**	**$1,750 (250)**	**$ — —**

In product quality and technical service, here's one case where we believe you'll find the biggest and the best are synonymous. Davison was first to introduce a commercial synthetic fluid petroleum cracking catalyst. To maintain that lead, we operate the world's largest laboratory facilities devoted exclusively to the development of catalysts. Result: Davison produces more than the rest of the industry combined. **Request:** How may we serve you?

DEPARTMENT C-11

W.R. GRACE & CO.

DAVISON CHEMICAL DIVISION

BALTIMORE 3, MARYLAND

"There is much evidence that we are on the verge of a scientific revolution that will transform our world more rapidly and completely than did the industrial revolution in the nineteenth century. This transformation will give to millions of people wider opportunities to satisfy their basic needs, and among them will surely be the need for more products derived from oil." —M. J. Rathbone, President

Standard Oil Company (New Jersey)

HUB OF YOUR STATION...

Gasoline pumps are silent spokesmen, inviting the motorist to stop and buy. The pumps most persuasive in appearance as well as the most precise in performance are **Smith-Erie**

New Smith-Erie submersible pumps feature these design improvements

A ELECTRICAL PLUG-IN eliminates the necessity of disconnecting wires and conduit when removing the pump and motor for servicing. Job can be done in minutes without the services of plumber or electrician.

B ELECTRICAL JUNCTION BOX is now part of stationary pump head, replacing swivel-type separate junction box. Reduces the overall height of the discharge head a full 5" . . . permits easy installation closer to pit cover.

C ONLY TWO CAP SCREWS need be loosened to free the removable section from the discharge head. Two eye bolts make lifting removable section a snap. Again, no special tools or personnel are required for servicing.

D VERTICAL, CENTRIFUGAL PUMP is quiet and smooth running . . . gives long, dependable service. ½ hp models serve up to four dispensers; ½ hp models serve up to six dispensers; ¾ hp models serve up to eight dispensers.

Smith-Erie was the first to build a motor-driven meter pump . . . first to build remote pumping systems for service stations. In keeping with this tradition of leadership, Smith-Erie announces *six* improved submersible pump models satisfying the requirements of the largest and the smallest stations. All incorporate the new features described above — all are designed to give continuous service, economy of installation, operation and maintenance.

Smith-Erie offers a broad and completely integrated product line. Besides gasoline pumps, Smith-Erie produces petroleum meters in a complete range of sizes and pressures, airport and marine dispensers, hand pumps plus a wide range of accessories. Write direct for further facts on any of these products.

Twins are available in both L3 and Salesman-48 models

Smith-Erie twin pumps have the same outside dimensions as the single pumps. They occupy a minimum of island space while supplying more volume by serving two customers at the same time.

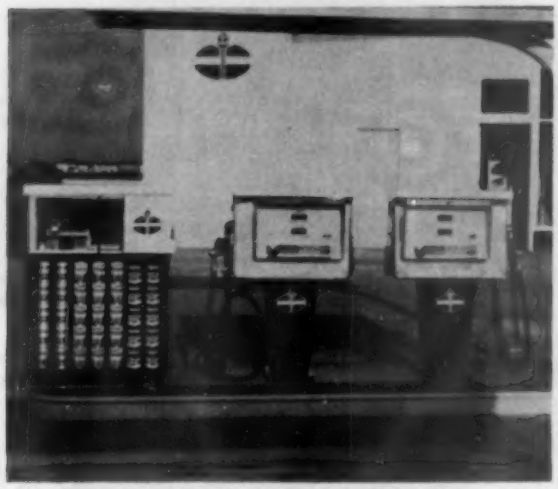
Through research . . . *a better way*

A.O.Smith
CORPORATION

Smith-Erie Division

Factory: 1602 Wagner Avenue, Erie, Pennsylvania. Offices: Atlanta 5, Georgia; Chicago 3, Illinois; Houston 2, Texas; Los Angeles 22, California; New York 17, New York; Oakland 21, California; Tulsa, Oklahoma. Canada: Toronto 12; Vancouver 1. A. O. Smith INTERNATIONAL S. A., Milwaukee 1, Wisconsin, U. S. A

Litho in U.S.A.



PROTOTYPE stations for Indiana Standard feature new two-grade pumps, lights, sloping roof, and back-opening bays.

TRANSLUCENT plastic canopies present eye-catching picture at Lion Oil's Orbit stations. Fluorescent lighting is used.

vide complete printed data for service station sales. It is intended that the ticket could be automatically scanned for use with the latest types of accounting equipment."

- "We can provide equipment which will transmit the computer data to a remote location for control, or for customer observation at that point."
- "We can also vary the location of the components of the pump to provide greater flexibility to the station designer. The computer may be in one location, the meter in another, and the pumping unit in still a third place."

The preset mechanism to which MacDonnell refers is being tested now by several oil marketers. Veeder-Root, Inc., the manufacturer, believes that the device will become commercially available early next year.

The imprinter pump, on the other hand, is unlikely to appear with the same rapidity. Marketers are concerned with the cost of converting their pumps to imprinter operation. And they anticipate a certain degree of dealer hostility if they attempt to pass along the cost of the imprinters to the dealers.

The third and fourth developments mentioned by MacDonnell were embodied in a new dispensing system that was introduced at this time last year (PW—Nov.6 '59,p124). It is called the Modular Electronic Fueling System, and it was developed by Bowser, Inc.

This system permits designers to separate the pump hose from the computer dials and position them anywhere in the station. Conceivably the hose and the dials could be separated so completely that the conventional pump pedestals of today might be eliminated from the station (picture, page 63).

Thus far, no actual applications of the Bowser electronic fueling system have been made at service stations. But early last month, H. W. Lloyd, vice president of Bowser's marketing division, revealed that "the system has been perfected to the point where initial installations will be made in the next sixty days."

Custom blending, perhaps the most significant pump innovation of the 1950s, may be extended in the near future to include the automatic mixing of gasoline and motor oil for small-craft owners.

Wayne Pump Co., the originator of custom blending, has been experimenting with pump nozzles that will, it hopes, overcome the problem of foaming, which occurs when gasoline and motor oil are mixed rapidly.

The custom blending of gasoline has also suggested a way of conserving space at service stations. Indiana Standard, which at present is not interested in marketing more than two grades of gasoline, has had Wayne design a pump that dispenses both grades through a single hose. Thus, a single pump unit will dispense either premium of regular gasoline with the flick of a switch (picture).

Lighting to Lend Atmosphere

Lighting of the pump island—and the service station exterior—has become brighter with the advent of improved light sources. But higher illumination is not the only advantage that marketers have achieved with more efficient lights.

By deriving more light from smaller sources, designers have been able to reduce the size of fixtures and lessen their weight. In addition, better control over lighting is achieved when the illumination emanates from a smaller source.

With better control, marketers are able to throw greater emphasis on the vertical elements of the station—the sign, the face of the building, and the pumps, for example —without having to resort to an over-all increase in wattage.

On the driveway, marketers can lessen motorist uncertainty by laying down a pathway of light, leading from the street to the pump island.

In the same way, lighting is being used to direct the motorist's attention toward TBA displays at the island, or to lead his eye into the station building. By keeping the pump-island area more brightly lighted than the surrounding driveway area, the driver may feel that he is 'inside' a merchandising area, one industrial designer believes. Lighting in island canopies helps here.

Similarly, the motorist's attention can be directed into the station salesroom, this designer believes, by carrying the pattern of canopy lighting into the ceiling of the station building (picture, page 70).

continued ▶

UNIFIED LIGHTING from pumps to office ceiling at this Sinclair Refining Co. station helps create a 'store' atmosphere.

SHOPPING CENTER station built by Cities Service offers drive-through bays and a compact display of pumps and TBA.

"Luminous elements," says one lighting manufacturer, "offer the newest approach to lighted building facades." They are achieved through lighting a translucent surface from behind with fluorescent lights.

One striking example of luminous service station lighting was introduced earlier this year, when Lion Oil Co. erected plastic archways at its Orbit stations (PW—Feb.19'60, p93). Through internal lighting, Lion achieved an eye-catching luminous effect (picture, page 69).

"For lighting inside the station salesroom, fluorescent back-lighted luminous walls and display cases, combined with incandescent spot lighting for sparkle," one manufacturer says, "are effective means of economically creating high vertical brightnesses, which overcome or counteract the reflections on the outer surfaces of the windows, now accounting for almost two-thirds of station facades."

Unity: How Important?

One aspect of service station design that is currently being re-evaluated is the need for design unity among all of a marketer's stations. Today, many marketers reject the notion that stations must possess some architectural cliche that may serve as a structural trademark for the company.

In the recent past, such trademarks had gained popularity with, for example, Cities Service Oil Co. and Shell Oil Co. (both of which relied on the pylon for identification), and Tidewater Oil Co. (which used the flared canopy).

Instead of these structural forms of unity, marketers are looking for more symbolic ways of tying their stations together.

The best example of this is provided by Mobil Oil Co., which is shaping island canopies and station facades so that they become distinctly reminiscent of the Mobil sign.

A similar approach has been tried by a few Canadian companies, which let their brand signs establish a theme that can be repeated in the building (picture, page 73).

The canopy seems to have fallen into disfavor among marketers, perhaps as a result of the trend away from structural cliches.

The cost of canopies, ranging anywhere from $2,000 to $12,000 is another important factor in the sobering attitude oil marketers are taking in regard to canopy stations. But a criticism more often mentioned by marketers is the lack of flexibility that accompanies the use of a canopy at service stations. Too often, they feel, canopies restrict the location of pump islands.

In the warmer climates, canopies serve a functional purpose, by protecting customers and attendants against heat and sun. But in the North, the only excuse for using them, marketers feel, is to attract attention.

And, for some reason, most major oil companies prefer not to resort to this approach because they regard it as ostentation. Perhaps, also, they are reluctant to become identified with a device that has become associated with private-brand marketing.

The only other use for canopies is in covering the pump area with a 'ceiling' of light—which, as noted earlier, may be effective in creating a 'store' atmosphere at the station. But oil marketers have either been slow to recognize this advantage or consider it a relatively unimportant justification for building a canopy.

Marketers and manufacturers are always looking for new materials to use at service stations. But so far, no universally satisfactory substitute for porcelain enamel has been found.

Most of the substitute materials are "priced out of the market," marketers feel. But one manufacturer told PETROLEUM WEEK that, "personally, I believe that plastics, aluminum, and ceramics are going to push to the fore in the new designs of service station buildings over the next five to ten years."

Some of these new materials have already begun to make appearances in test stations. Pure Oil Co., for example, has constructed one aluminum station in Cleveland, and plans another for Waukegan, Ill.

Sun Oil Co. has erected a station with reinforced acrylic panels at Bridgeville, Del.

The prefabricated service station still is highly regarded by many major oil marketers—but not especially because they value its ease of construction.

Nor do marketers give much consideration to the mobility feature of prefabricated stations. In fact, they rarely choose prefabricated stations because (1) they need to build a station in a hurry, or (2) they plan to move the station in a year or two.

Occasionally, these factors are important. But most often they are subservient to two other features of prefabricated stations that are—and will continue to be—much more important: (1) ease of maintenance, and (2) clean appearance.

Some marketers use prefabricated service stations very sparingly, if at all. Atlantic Refining Co., Sun Oil Co., and

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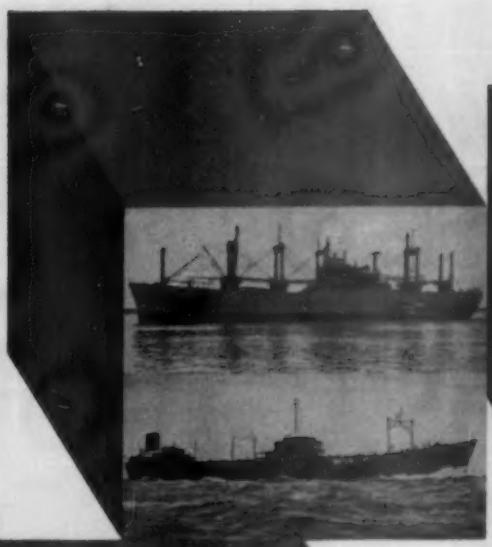

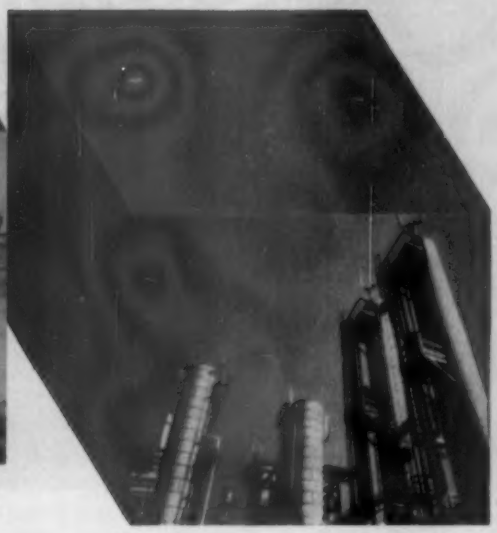

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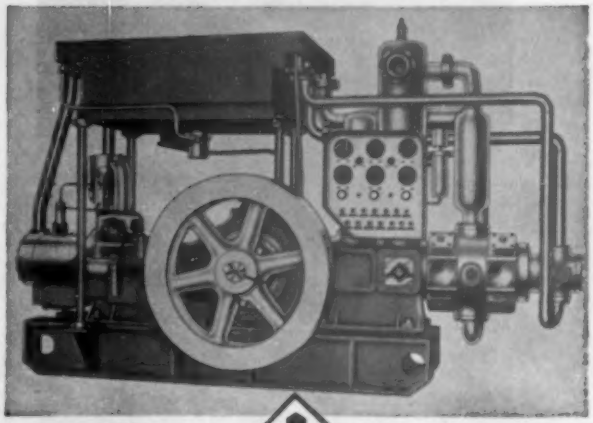

THE *NEW* DPC-60 ENGINE-COMPRESSOR UNIT

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Oil Field Distributors

- The National Supply Co. — Pittsburgh, Pennsylvania
- Bethlehem Steel Co. — Supply Division, Tulsa, Oklahoma
- Mid-Continent Supply Co. — Fort Worth, Texas

Humble Oil & Refining Co. are examples. One reason, certainly, is that prefab stations very often cost just as much as conventional concrete block stations, and, occasionally, even more.

One prefab manufacturer believes that "oil companies have not moved as quickly toward prefabricated, all-porcelain stations as we had hoped for, because initial cost is high." But, he adds, oil companies "have said they'll make heavy use of porcelain enamel prefabs when the cost comes down a little. Now it is on the way down."

One way in which prefab makers are trying to reduce the price of their product is to exercise greater control over the actual construction of the stations. One manufacturer offers a package that includes all the structural components of the station, including the windows. Another manufacturer offers all the utilities, wiring, and tubing, and practically prepares the service station for operation. Only the pumps are supplied by another manufacturer.

Through these various degrees of prefabrication, oil marketers are offered more definite cost estimates than if the station were handled more or less wholly by local contractors.

UNITY between the identification sign and the variegated exterior are the hallmark of this British Petroleum station.

Diversification Coming

One phase of service station design that is currently being re-evaluated centers on the basic function of the stations themselves. Many marketers foresee an eventual trend toward closer marketing relationships between service stations and other retail outlets.

No longer can the station remain a strictly automotive servicing center, these marketers believe. More and more, nonautomotive products and services must be incorporated into the station to attract motorists.

One phase of this development has already begun: The service station is teaming up with other retail institutions to provide a more convenient grouping of services for motorists.

On the turnpike, for example, the station has become intimately associated with the restaurant and the gift shop. At bypass locations, the service station has snuggled close to motels. In the suburbs, service stations are finding themselves a place in shopping centers.

Another aspect of this trend is represented by the increased use of vending machines at service stations. Such machines provide an inexpensive way for dealers to diversify their services.

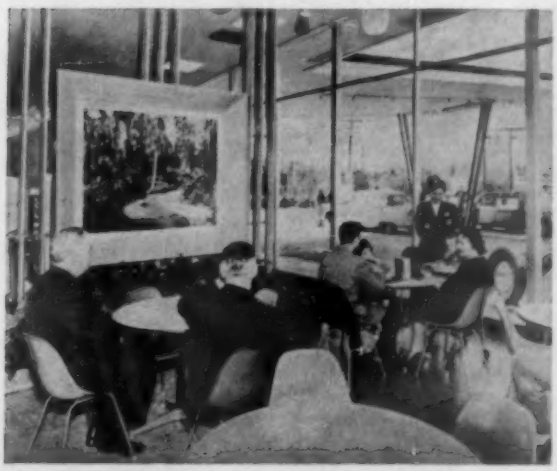
The vending machine has also been used as an inducement to the reluctant motorist to leave his car and browse among the TBA displays.

Because vending machines have this important dual function, many marketers are devoting special attention to the machines, and have even constructed special sheds under which to group them to an attractive setting.

Tidewater and Shell are two companies that have experimented with such sheds. Pure and others, have made plans to set vending-machine patios alongside their stations.

Esso Standard division of Humble Oil & Refining has, without doubt, carried this trend to its ultimate at its Moto-Mat station in Gramercy, La. (PW—Mar.4'60,

continued ▸



ESSO'S MOTO-MAT is a service station with a built in cafeteria. Here vending machines serve cakes, coffee, and candy.

AIR CONDITIONED dining lounge is attended by a smiling hostess. The Moto-Mat also features an outdoor dining patio.

p82). Here, an entire battery of vending machines, offering a complete selection of soup, toasted sandwiches, and fruit juices, is accompanied by an outdoor dining patio and an air-conditioned "lunch-and-lounge" salon. The Moto-Mat is actually a cafeteria, nursery, and playground, combined with gasoline pumps and motor oil racks.

Some Obstacles to Change

There are three obstacles that must be overcome before oil marketers can proceed very far with the reshaping of their service stations:

- The growing municipal repugnance to service stations, themselves.
- The dealer, and the problem of deciding how much weight should be given to his views on station design.
- Industry opposition to change, which threatens to hamstring every innovation with the argument that present methods are satisfactory.

The distaste of city planning groups for the service station has made itself felt, marketers believe, in unfair restrictions on station construction, including building materials, the thickness of walls, the location of signs, and the layout of the station building.

In many areas, marketers are prevented from constructing their basic models and must erect a station that matches "the character of the community." "In ten years, we may have to build a different service station for every community we enter," exclaims a marketer who is fearful of the proportions to which this problem can grow.

To a great extent, marketers' difficulties with city planning groups arise out of their insistence upon locating their stations in strictly residential areas.

This point was made last month by Allen Fonoroff, of the Cleveland City Planning Commission, in a talk to API's Operations & Engineering Committee.

Much of the dispute between oil men and local groups could be alleviated, Fonoroff said, if the two groups could, by joint effort, develop standards for site location, general appearance, and the development of service stations. He admitted that some current zoning regulations are "arbitrary and unreasonable from the standpoint of the zoning official, himself."

But, he also warned the O & E committee, "Too many service stations are eyesores. They are ugly, and their ugliness detracts from the neighborhood. They are ugly because of poor taste in architecture, loud and indiscriminate forms of advertising, outdoor storage and display of products and small trailers, and a general appearance of disorder."

The controversy over the dealer's influence on station design points up a much more fundamental question in oil marketing: Is the major oil company a supplier for its dealers? Or, is it a marketer to its consumers?

A president of a large midwestern oil company does not hesitate to answer: "We're not designing our stations to please dealers. We design them to attract the public. If you let the dealer have all he wants, you'd have to give him gold-plated desks."

Pitted against this consumer orientation is the viewpoint that oil marketing is, by and large, a local business. It is a business run by dealers who are close to their customers. The dealer's opinion, therefore, should be given prime consideration in station design, according to this thinking.

"How can Madison Avenue design a service station for Kalamazoo?" exclaims a vice-president who holds to this view. Private-brand stations are successful, he says, because they are designed for the area they serve. Major-company stations, on the other hand, are too often standardized billboards, promoting only the supplier's brand name.

There are other points of disagreement:

- Suppliers, anxious to attract attention to service stations with bright lighting, often find dealers reluctant because of the high electricity expenses.
- Dealers who stress the need for more storage space and work area in lube bays find suppliers accenting the salesroom and TBA displays.
- Most suppliers agree on a need for wider driveways for service stations, but dealers who have to operate the stations often fret about the distance between the cash register and the pump island.
- Suppliers are always urging the dealer to keep his restrooms clean. But, the dealer—often the untidiest person to use the restroom—wants a room of his own, so that he won't have to use the restrooms provided for the motorist.

The final obstacle in the way of modernization is the biggest: Opposition to change. There are many in the industry who hesitate to make costly changes that do not promise immediate increases in sales.

There are others, closely allied with this cost-conscious group, who always vote against change because the public "isn't ready for it yet." These marketers are loath to introduce any innovation that will "confuse the motorist."

Some other arguments against change come from those who would logically be expected to be most in favor of it—equipment manufacturers and industrial designers.

- "Every new design of pump which results in a final piece of equipment with a new appeal," says one pump manufacturer, "in effect makes obsolete all existing equipment. Consequently, the capricious redesigning of pumps can only create a problem, rather than solve one."
- Another pump manufacturer sees no market in change: "We believe the major demand will continue to be for the more or less conventional gasoline pump in the various models in which it is furnished. Combinations of other marketing equipment with pumps, remote indicators, and radical changes in appearance may all be used to some extent in unusual stations, but we do not foresee any appreciable volume for this type of equipment."
- "We're not going to be swayed by every fad that comes along," says an industrial designer. "We're still designing stations that look very much like the ones we did 25 years ago. We think we can still design service stations that will last another 25 years."

Reprints Available

Reprints of this report are being prepared and will be available in December. Single copies will be sent to Petroleum Week subscribers on request without charge. Additional copies will be billed at the following rates: 1-10 copies, 50¢ each; 11-100, 40¢ each; 101-1,000, 30¢ each; over 1,000, 20¢ each. Address orders to:

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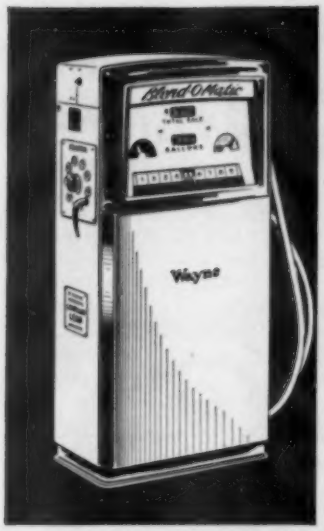

Why this pump is changing the history of gasoline retailing

NEW MARKET RESEARCH FINDINGS CONFIRM PREDICTIONS MADE FOR BLENDING

With today's diversified car population, many refiners have already gone to three products in an effort to hold their total market. And the trend is for the octane spread to continue to widen, bringing pressure for costly 4- or even 5-product systems.

The Wayne Blender solves this marketing dilemma. Using just two products—regular and super high octane—it dispenses up to 9 grades of gasoline, meeting the needs of every car on the road today or in the foreseeable future. The customer gets the performance he wants and saves 1 to 4c a gallon.

Now evidence is available to *prove* that the Wayne Blender not only attracts new customers, but also fortifies loyalty among old ones. Here are the highlights of a new independent study of station management and customer opinion in three major markets where the pump is now used:

- **96% of all blending dealers believe they have obtained new customers because of the pump; 9 out of 10 believe the loyalty of old customers has increased because of it.**
- **Of non-blending dealers expressing an opinion, 68% believe their business would increase if they had the pump.**
- **75% of customers of blending stations feel they save money by using the pump.**
- **At least half of the blending customers became regular customers of their stations after installation of the new pump.**

The benefits of blending do not end with increased station sales; they reflect through your entire operation. One refiner, for example, reports a saving of over $80,000 per million barrel run because of lower pool octane number resulting from the change to blending.

Meets All Marketing Situations—Today, Tomorrow

Not to be overlooked is the blender's adaptability to 2-product marketing now; multiple product later. The refiner who wants to stay 2-product a while longer—yet foresees multi-product demand in his market—can meet both needs with the blending pump. Changing only piping, he uses the blender to dispense two grades today; three or more tomorrow. His island and underground investments are protected, for changeover is made entirely within the pump—in 24 hours!

What has been the total experience of refiners who have adopted blending? One increased sales 8% the first year—double the industry average. Another reported a whopping 20% increase following its recent changeover. Both companies attribute the increase directly to blending.

A new 20-page booklet on the marketing advantages of blending is available on request. Contact W. C. Leitch, Vice President, The Wayne Pump Co., Salisbury, Md.

Wayne

WORLD'S LARGEST MANUFACTURER OF GASOLINE PUMPS AND SERVICE STATION EQUIPMENT

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Radiation Grafting Improves Polymers

Radiation grafting, a new polymerization technique, may be able to impart to hydrocarbon and fluorocarbon polymers certain desirable qualities such as bondability, printability, dyeability, and great thermal resistance.

The technique is now being developed by Radiation Applications, Inc., Long Island City, N.Y., a research firm partly owned by Schenley Industries, Inc. It will soon become commercially available, Dr. Horace W. Chandler, RAI's research coordinator, told PETROLEUM WEEK last week.

The technique has already been applied on a semicommercial scale to modify the surface properties of fluorocarbons.

Fluorocarbons are essentially polymers of tetrafluoroethylene (TFE), such as Teflon, made by E. I. du Pont de Nemours & Co., and chlorotrifluoroethylene (CTFE) such as KEL-F, made by Minnesota Mining & Manufacturing Co. Vinyl fluoride and vinylidene fluoride, made by these two companies, and also by Pennsalt Chemicals Corp., are promising newcomers in the field.

Glycol Pilot Unit

Celanese Chemical Co. has been making 1,3-butylene glycol in this semicommercial unit at Bishop, Tex., since 1958. The first full-scale commercial unit is now under construction. It will have a capacity of 25-million lb. per year.

Butylene glycol is used to make plasticizers for polyvinyl chloride, and as an additive for many products.

These polymers have unique properties due to their complete inertness to chemicals and their great heat resistance. One of their principal uses is as protection against corrosion. They can be used at temperatures ranging from —400F to +550F.

These fluorocarbons do not adhere readily to metals and other polymers, however.

Complicated processes are generally required, RAI says, and even then, the results are questionable. High temperatures are often necessary, leading to discoloration of the material.

But by grafting easily bonded monomer to the surface of the fluorocarbon under radiation, good bonding qualities can be obtained, with no loss of resistance to corrosion or to temperature variations.

Thus, electric wire insulated with one of these fluorocarbons is now being treated at RAI, and can be potted and encapsulated in all sorts of plastics—epoxies for example—with good adhesion.

The process is not a coating, but an actual molecular bond resulting from nuclear radiation, RAI says.

When the material grafted to the polymer is "compatible" with this polymer, Chandler explains, copolymerization takes place, and the two materials are evenly distributed throughout. On the other hand, when the material selected for grafting is "not compatible" with the polymer, surface grafting takes place.

Radiation treatment is also being developed to impart greater temperature resistance to polyethylene and to polyvinyl chloride, both used for wire and cable insulation.

Polyethylene, RAI indicates, is difficult to crosslink, and the process requires great amounts of radiation.

Actually, the process may well turn out to be a combination of molecular reorientation and crosslinking, RAI predicts. A medium-density polyethylene is being used for the experiments.

Certain additives will substantially increase the rate of grafting, it has been found.

Methanol, for example, when used as solvent for the monomer, has been found to activate the grafting process. Certain olefins also improve it.

Therefore, RAI plans to carry out an extensive program of research to determine which solvents and additives are both the most active and the most economical from the point of view of radiation dosage.

Radiation grafting on polypropylene makes it possible to print the film or dye the fibers, two processes that are almost impossible to perform with the untreated polymer.

Methacrylic acid and other monomers, RAI says, have been used to modify the molecular structure of the polypropylene under the action of radiation, and condition it to accept a variety of dyes.

Nylon can also be substantially improved by grafting under radiation, RAI believes.

One of the drawbacks of industrial nylon is its tendency to absorb water. This is undesirable because it changes both the nylon's properties and its dimensions. One of RAI's research projects is to make nylon more resistant to water absorption, by irradiation.

Both Cobalt 60 and electron radiation are being used for this grafting work, and a comparative study of the two techniques is being carried out by RAI, under sponsorship of the Atomic Energy Commission's Office of Isotopes Development.

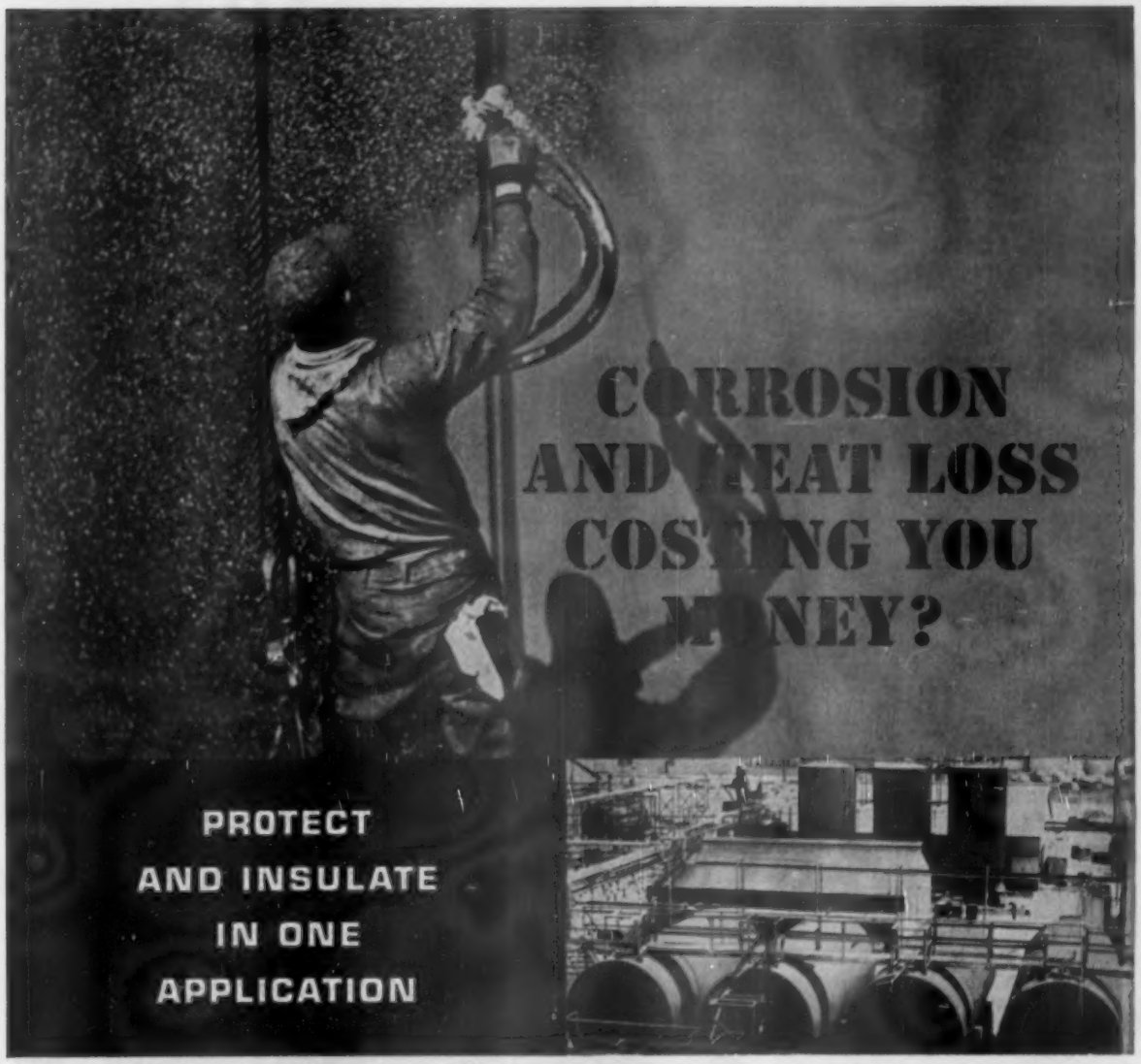
The purpose of the study is to reduce the radiation requirements for these various processes.

RAI has its own Cobalt 60 source. For electron radiation, it rents time on electron accelerators at General Electric Co., High Voltage Engineering Corp., and Radiation Dynamics, Inc.

RAI feels that its research should concentrate on waste materials from power reactors. These nuclides, such as Strontium 90 and Cerium 14, will become available at low cost in the years ahead.

Other laboratories, in the U.S. and in Europe, and also pursuing studies of radioactive grafting and crosslinking.

One of them is North Carolina State College, which is studying the effect of radiation on the surface activity of fibers at its textile research center.



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For more exacting insulating jobs on heated storage tanks that contain Bunker "C" and other heavy fuel oils or chemicals that must be heated between 150° and 300°F, Pioneer #820 Insulation does an outstanding job. Fuel heated to 225°F at 70°F outside temperature will rise to 271°F after a ⅜-in. coating of Pioneer #820. This cold application spray-on insulation can pay for itself in 3 to 6 months in fuel savings.

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More Versatile Diesel Fuel Sought

Extensive work is being carried out to find a diesel fuel that would be widely available in refineries, and satisfactory for the greatest number of engine types.

Southwest Research Institute is currently engaged in a study of combustion characteristics of diesel fuels for that purpose.

Up-to-date results of this work were presented last week at the national fuels and lubricants meeting of the Society of Automotive Engineers, in Tulsa, by the director and several engineers of SwRI's ordnance laboratory.

This research program is being complemented by studies made at the Aberdeen Proving Ground and at the Ordnance Tank-Automotive Command of the Office of the Chief of Ordnance, U.S. Army.

The basic conclusion of the work so far is that cetane number is the most important parameter for predicting combustion properties of a diesel fuel, regardless of its composition.

Good combustion in a diesel engine is generally determined by the "ignition delay" of the fuel: It must be kept low. The tests showed that, regardless of fuel composition, a higher cetane number means a shorter ignition delay.

Other significant conclusions:

- Long, straight-chain paraffins shorten ignition delays, and are good diesel fuels. Branched-chain hydrocarbons, on the other hand, appear to have significantly poorer combustion qualities.
- Aromatics—which have a low cetane number—have undesirable combustion properties in diesel engines, and should never be present in concentrations higher than 10%.
- The number of carbon atoms in the side chains of aromatics, as well as the position of these side chains, have an influence on combustion characteristics. For example, a propyl benzene is the least desirable of the alkyl benzenes, and a 1,4-dimethylbenzene is not as good a fuel as a 1,2- or a 1,3-dimethylbenzene.
- Results with olefinic test fuels were the least consistent, but combustion was satisfactory when the olefinic concentration did not exceed 20%.
- Intake-air temperature appears to have no effect on the relative ranking of combustion properties of the fuels over a range from 0F to 150F.
- Addition of up to 1% of amyl nitrate to the fuel reduces ignition delay, particularly when the cetane number of the fuel is low.

The fuels that were evaluated in these tests included both chemically pure individual hydrocarbons, and a selection of cuts readily available in refineries.

Over 50 pure materials were obtained from various suppliers. They included paraffins, aromatics, olefins, and cyclic compounds, mostly within the 130F to 530F boiling range.

And nine types of refinery-produced cuts were used, with boiling ranges between 153F and 495F. They were added in various proportions to a base diesel fuel. The cetane number of all these fuels varied between 35 and 40 "in order to remain realistic," SwRI says.

Performance of the refinery cuts was generally comparable to that of the pure hydrocarbons.

The tests so far have been done in laboratory engines. The results are now being checked by tests in a variety of full-size engines.

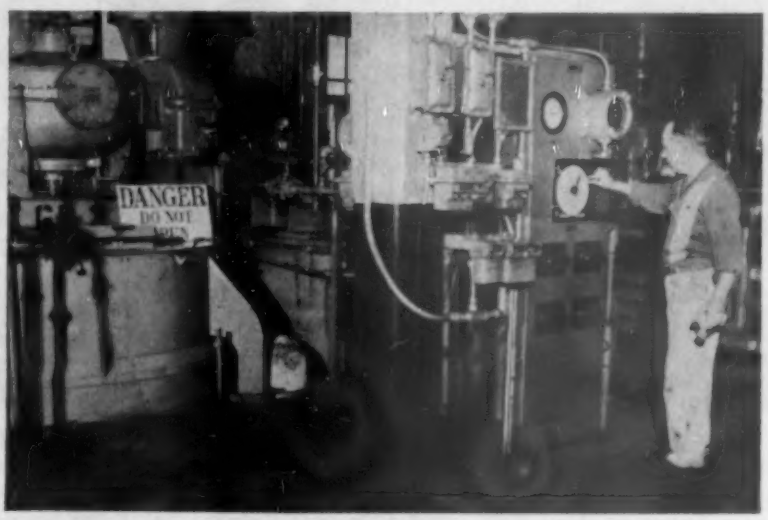
What SwRI designates as "the first part of an extensive program," was accomplished with three laboratory engines:

(1) An ASTM-CFR single-cylinder engine, which has a variable-compression-ratio combustion chamber, and small fuel requirements.

(2) A Labeco CLR engine, also single-cylinder, but more representative of production engine designs.

(3) A General Motors 3-71 3-cylinder engine, modified to give results comparable with those obtained with the other two engines.

The full-size engines in which these results are currently being evaluated are a Continental AVSD, a Hercules D-426 Polydiesel, and a Continental LDS-427 Hypercycle.



GREASE KETTLE at Atlantic Refining Co. does not use steam, but electrically heated . . .

Dowtherm Heat-Transfer Medium

Use of Dowtherm A—a mixture of diphenyl and diphenyl oxide—instead of steam to heat a grease kettle has spared Atlantic Refining Co. the installation of a new boiler.

The company wanted to boost its grease production schedule. This would have required more heat than the existing boilers were capable of generating. A new gas- or oil-fired boiler, with pumps and auxiliary equipment, would have been quite expensive.

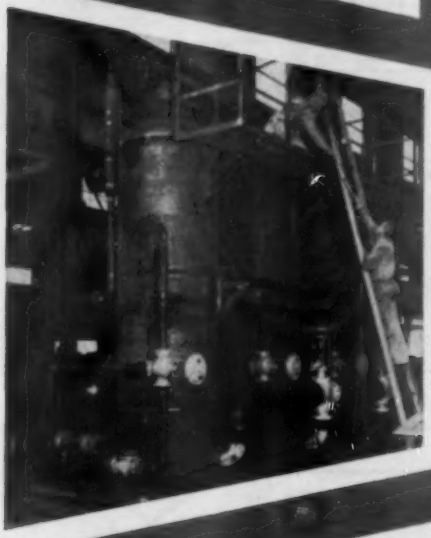
Instead of a steam boiler, four 55-kw. electric immersion heaters were installed in a self-contained vaporizer, filled with Dowtherm A as a heater-transfer medium.

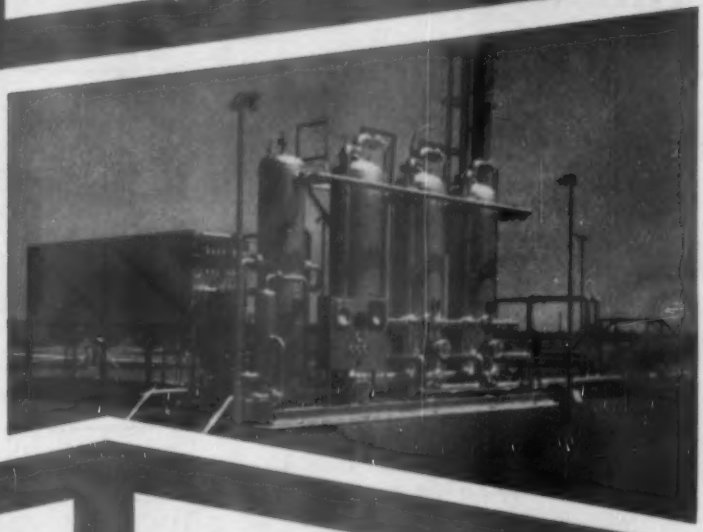
The grease kettle has a 1,500-gal. capacity. To heat it, 300 gal. of the Dowtherm A are used. This heat-transfer medium is brought to a temperature of 620F and circulated around the kettle, in a mixed liquid-vapor phase.

Dowtherm is produced at Dow Chemical Co. by dehydrogenation of benzene. It is a mixture of phenyl-

SUPERIORITY

FROM START TO FINISH...





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benzene (diphenyl) and phenyl-ether (diphenyl oxide).

Its use is rapidly increasing as an economical heat-transfer medium. It is used in over 500 plants today, Dow says.

Main advantage of Dowtherm over steam as a heat-transfer medium: When its temperature is 700F, it exerts a pressure of only 95 psi. Steam, at the same temperature, would exert a pressure of 3,000 psi.

This lower pressure means that less expensive, thinner-shelled equipment can be used, which also requires less space. Precautions required for high-pressure equipment are not needed.

Heating efficiency with Dowtherm is very high. The efficiency of the grease kettle at Atlantic is 20% higher than it was with conventional equipment, the company says.

And maintenance of the unit poses absolutely no problem. The system is vented every week to prevent accumulation of air and water vapor. Very little make-up Dowtherm is required.

Atlantic also has a gas-fired boiler to heat Dowtherm for a separate system of kettles, in which the company's other lines of greases are made.

Elastomers Find Uses in Construction

Synthetic elastomers, of petrochemical origin, are assuming a constantly wider place in the field of construction.

This is due to the ability of elastomers to damp vibrations and to suppress noise, thanks to one of their most important physical characteristics: They return to their original shape after having been distorted.

In addition, synthetic elastomers can now be produced economically, with good resistance to chemical attack and to wear.

At a recent meeting of the American Society of Mechanical Engineers in Erie, Pa., E. E. Thielker, of E. I. du Pont de Nemours & Co., related the progress made by synthetic rubbers in construction. Their uses include:

- Bridge girder bearing pads.
- Supports for heavy structures.
- Foundations for test chambers.
- Mountings for precision instruments of all sizes.

Synthetic rubber bearing pads are being used to support bridge girders, in preference to conventional metal sliding plates or rollers and rocker arms.

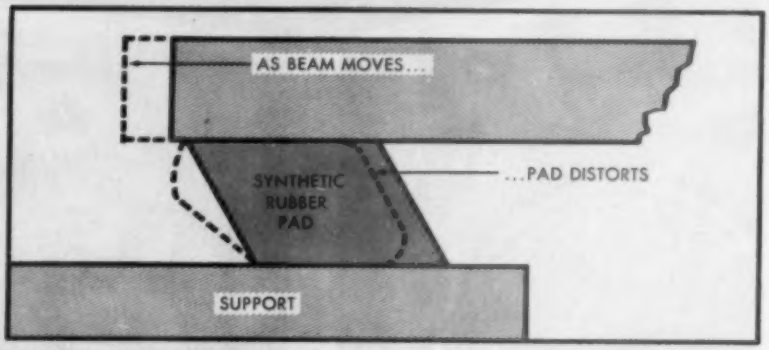
Elastomer bearing pads have been used for some time in bridge construction in France and in the British Commonwealth. Their use has recently spread to the U.S. and Canada.

These pads have three important advantages: economy, effectiveness, and absence of maintenance.

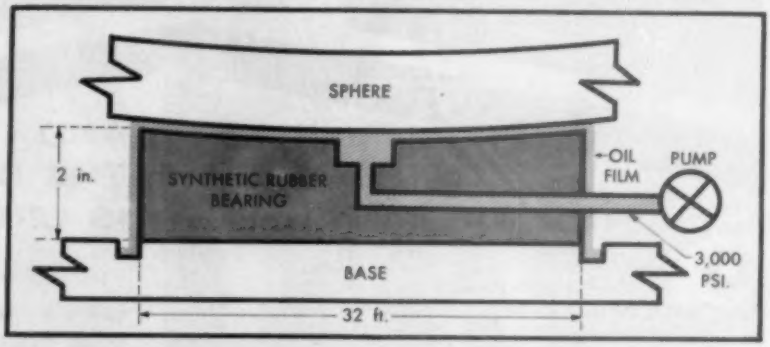
The rubber bearing has no moving parts; it is simply a flat pad, with or without shims, placed between the beam and the pier or abutment.

As the bridge beam expands or contracts, the pad changes shape to conform to the movement (upper diagram). The movement takes place within the rubber; there is no "starting friction" to overcome, no "corrosion deposit" to break loose, no opportunity for a "frozen bearing."

Also, there is no need for lubrication or for cleaning.



HOW SYNTHETIC RUBBER acts as a pad (above) and a thrust bearing (below).



Neoprene vulcanizate is one of the synthetic rubbers that possess the combination of physical properties that is required for this type of application.

It has high resistance to weather and to natural aging, and ample compressive strength to act as a bridge bearing. Properly designed, Du Pont says, neoprene can support compressive loads up to 1,000 psi., which approaches the maximum acceptable load for the bridge beams themselves.

The shape of the rubber pad is important, Thielker pointed out. A numerical relation, called the "shape factor," has been developed, which makes it possible to design the correct shape of pad for a given load. When the pad must be made very thick, because of a heavy load, shims are used, to make it a laminated pad.

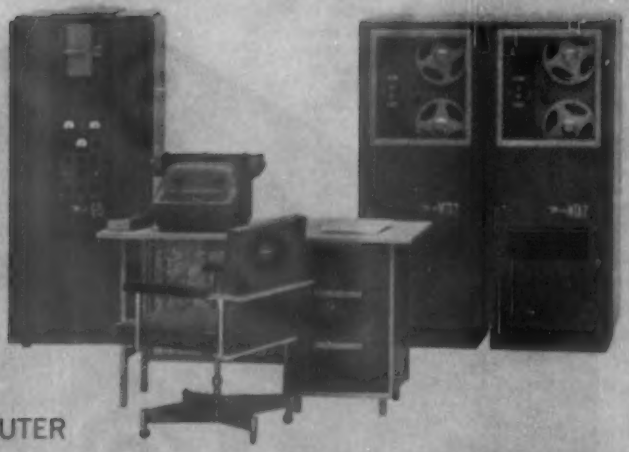
For bearings that must support very heavy loads, urethane rubbers, also of petrochemical origin, are used.

Load-bearing capacity increases rapidly with the hardness of the rubber, and urethane can be made very hard.

For example, Thielker cites the case of urethane bearing pads—Adiprene in this case—being used to support a radome and radome shield (lower diagram). Six pads, each 2 in. thick and approximately 32 ft. in diameter, support the 175-ft.-diameter sphere, weighing 2,500 tons.

Lubrication facilities can be designed into the elastomer bearings when needed.

In the case of the radome support, oil at 3,000 psi. pressure is supplied through the adiprene pads to the under side of the heavy sphere.



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PROBLEM: $$I = \frac{E}{\sqrt{R^2 + (6.2832\,FL - 1/6.2832\,FC)^2}}$$

(For values of R F & L as specified. For values of E ranging from 100 to 300 in increments of 50. For values of C ranging from .00002 to .000021 in increments of .0000001)

COMPLETE ALGO PROGRAM:

```
BEGIN ⑤
R = 10 ⑤
F = 60 ⑤
L = ₀2 ⑤
FOR E = 100(50)300 BEGIN ⑤
FOR C = ₀00002(₀0000001)₀000021 BEGIN ⑤
I = E/SQRT(R ↑ 2 + (6₀2832 * F * L — (1/(6₀2832 * F * C))) ↑ 2) ⑤
PRINT (FL) = E ⑤
PRINT (FL) = C ⑤
PRINT (FL) = I ⑤
```

Write on your letterhead for the self-teaching ALGO manual.

Bendix Computer Division
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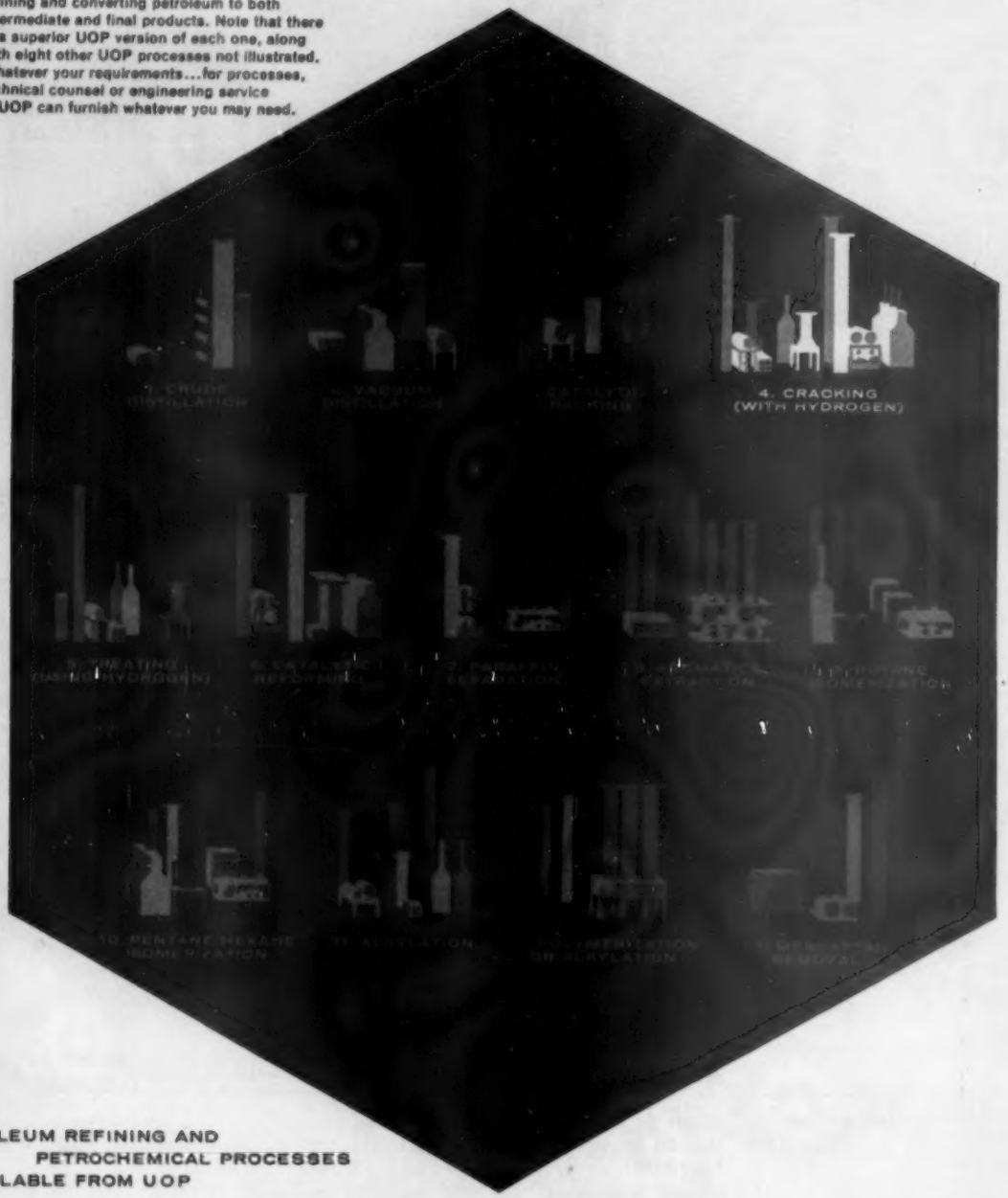
Here are symbolized the major processes for refining and converting petroleum to both intermediate and final products. Note that there is a superior UOP version of each one, along with eight other UOP processes not illustrated. Whatever your requirements...for processes, technical counsel or engineering service ...UOP can furnish whatever you may need.



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5. **UNIFINING™**—a modern process that completely purifies petroleum distillates.

6. **PLATFORMING®** produces high octane gasolines, high purity aromatics.

7. **MOLEX™**—a new continuous separating process that removes lowest-grade hydrocarbons from gasoline.

8. **UDEX®**—the ideal process for separation of super-purity aromatics.

9. **BUTAMER™**—a new and practical process for producing isobutane.

10. **PENEX®**—a new process that converts light, normal paraffins to isoparaffins.

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13. **MEROX™**—a new and inexpensive treating process to remove mercaptans from gasolines and light distillates.

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ALKAR™—produces ethylbenzene, cumene and other alkylated aromatics from Fluid Cat Cracker off-gas streams.

UNISOL®—an economical process for treating high mercaptan-containing gasolines.

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FOR YOU!

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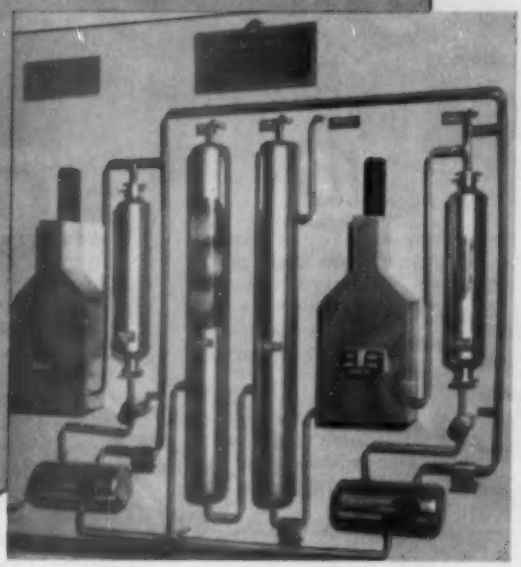
With UOP processes the refiner can accomplish just about anything that comes within the realm of practical petroleum refining technology. Take a look at the brief descriptions on the opposite page, and you'll agree. And remember, in many cases existing equipment can be revamped and expanded, and thereby will produce more saleable products.

*INFORMED OPINION indicates that 1962 will require a substantial increase in process capacity ...NOW is the time to start your planning! Ask us about a preliminary proposal... no obligation!



LOMAX™ With this new and highly flexible UOP process, model of which is shown above, the refiner is able to increase production of his most currently saleable product on a year-'round basis. Through the catalyzed reaction of oil with hydrogen, LOMAX converts middle distillates ranging from kerosines to heavy gas oils into a wide ratio of gasoline or distillate fuels.

As seasonal demands change, LOMAX production of these products is adjusted accordingly.

Important additional benefits afforded by LOMAX include distillates of exceptionally high purity (even from sour crudes) . . . predominance of branched isomers in light hydrocarbons . . . greatly reduced quantities of light gases . . . olefin-free products . . . long catalyst life . . . and other advantages.

LOMAX may be used to supplement existing facilities, or as a basic cracking operation in a new installation.

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What's New / IN PROCESSING

California Research Corp.'s new isocracking process will be used at a $20-million plant to be built at Tidewater Oil Co.'s Avon (Calif.) refinery.

Tidewater was given the second license for the Cal Research process; Standard Oil Co. (Ohio) received the first (PW—Oct.14'60,p42).

Tidewater's new facilities at Avon will include a 20,000 b/d isocracking unit and a 50-million-cu. ft. hydrogen generating plant. Construction is expected to begin early in 1961.

•

Facilities are being expanded at Amoco Chemicals Corp.'s Joliet (Ill.) plant to boost the company's dimethyl terephthalate capacity by 50%.

Dimethyl terephthalate manufactured at Joliet comes from terephthalic acid, which is produced by Amoco's process of air-oxidation of xylenes in liquid phase (PW—Sep.30 '60,p39).

It is an intermediate used in the manufacture of polyester films and fibers.

•

Microtraps, zeolite crystals with unique qualities of selective adsorption and dehydration, are now being produced commercially by W. R. Grace & Co.'s Davison Chemicals division.

Davison, which has its own processes to produce Microtraps, has also been licensed to use processes patented by Linde Co., a division of Union Carbide Corp., to manufacture molecular sieves, its own synthetic crystalline zeolites (PW—Jun.26'59, p34).

Microtraps and molecular sieves have similar applications in the separation of hydrocarbons, dehydration of various gases, and refrigeration drying.

•

A contract for the construction of a urea unit at the new Joplin (Miss.) facility of Solar Nitrogen Chemicals, Inc., has been given to Arthur G. McKee & Co. An ammonia unit is currently being constructed there by M. W. Kellogg Co. (PW—Jun.17'60, p75).

The urea unit will be the first in the United States to use a process licensed by Stamicarbon, N.V., of the Netherlands. Construction of the unit, which will cost between $2-million and $3-million, will begin in February, with completion expected in October.

The Joplin facility will produce anhydrous ammonia, urea, and related products. It will be operated by Atlas Powder Co., joint owner of Solar Nitrogen along with Standard Oil Co. (Ohio); products will be marketed by Sohio Chemical Co.

•

A new Universal Oil Products Co. subsidiary has been set up in Los Angeles to manufacture and market Purzaust, UOP's catalytic muffler to aid smog control.

The company, Universal Oxidation Processes, will begin operation as soon as Purzaust is certified by the California motor vehicle pollution control board.

•

Esso A.G. will increase the amount of olefins it produces from the output of its 70,000 b/d refinery at Cologne, from 7% to 14%. Facilities for the increase will cost $12-million.

The present petrochemicals capacity is 45,000 tons per year of ethylene, 35,000 tons of propylene, and 7,500 tons of butadiene.

•

Polypropylene glycol and propylene oxide triols are being produced at Jefferson Chemical Co.'s newly renovated plant at Conroe, Tex., which it purchased from Gulf Oil Corp. less than a year ago.

Morpholine, an intermediate in rubber chemicals and corrosion inhibitors, is also being manufactured there. Jefferson plans to produce other chemicals there as soon as additional improvements are completed.

•

About 30-million gal. of gasoline annually will be produced at a new Canadian Oil Companies, Ltd., refinery, now on stream at Innisfail, Alta. Cost of the plant was $4-million.

Most of the production is slated for the company's 250 White Rose service stations in Alberta. The company, which processes only Canadian crude, also operates a 50,000 b/d refinery at Sarnia, Ont.

High Pressure Check Valve
Fig. 9160 10,000 lb WOG
Horizontal or Vertical

Edward Check Valves give positive protection against flow reversal

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Ball Check Valve
Fig. 4632, Bolted Bonnet
Rating: 600 lb at 900F
(2000 lb WOG)
Horizontal or Vertical

Piston Check Valve
Fig. 3578, Union Bonnet
Rating: 1500 lb at 850F
(3600 lb WOG)
Horizontal or Vertical

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Japanese Posting May Tell the Tale

(From Petroleum Week's Beirut Bureau)

BEIRUT—Saudi Arabian Oil Director Abdullah Tariki is making it clear that the question of posted price for Japanese crude in the Saudi-Kuwait Neutral Zone isn't settled yet.

An initial posting more or less in line with current Persian Gulf prices was announced recently by the Japanese-owned Arabian Oil Co.

Nonetheless, informed circles believe there is still a wide gap between company and government views on pricing and discounts.

The Japanese announced their initial posting even before the dust had settled around the controversial oil pricing formula proposed by Tariki at the Second Arab Oil Congress (PW—Oct.21'60,p28).

Application of that formula would mean, among other things, a sharp increase in Middle East postings.

The Japanese posting "has not been made with our full consent—we can change it any time," Tariki told Petroleum Week last week.

"Arabian Oil came to us and told us they were in a hurry to post a price for Khafji crude because they were going to sign contracts in December," Tariki said. "They themselves suggested the price, based on the comparable Safaniya crude."

"We told them to go ahead and announce a price in line with Safaniya crude if they wanted to—until we make our own studies of tanker rates and the like."

But, Tariki added, "we told them we shall give our approval only after going into the question thoroughly."

Arabian Oil posted its Khafji crude at $1.42 for 26.0-26.9-gravity, with a 2¢ differential per degree of variation, f.o.b. Ras al-Khafji. The posting for Safaniya crude is $1.47 for 27.0-27.9 gravity, f.o.b. Ras Tanura.

The posting appears to be 1¢ to 1½¢ off the Safaniya price, industry sources figure.

With the 2¢ differential taken off for the one degree variation, the Khafji is still 3¢ under Safaniya.

Tariki says this 3¢ difference is due to the transport time difference between Ras Tanura, where Safaniya crude is loaded, and the Khafji offshore loading terminal farther north.

Industry sources, however, estimate the difference for the steaming time shouldn't be more than 2¢, and probably only 1½¢, since the difference between Ras Tanura and Bandar Mashur, across the Persian Gulf, is 2¢.

"We shall accept no discounts on Khafji crude at this time," Tariki said. "We will study each case individually for long term contracts—but we're not in favor of any discounts."

Before the posting was actually announced, Arabian Oil's president Taro Yamashita had also told PETROLEUM WEEK that the Saudi and Kuwait governments "do not wish to see any discounts on our crude." Hence, he had said, "our price will not be discounted."

Industry sources doubt that the Japanese will be able to sell their Khafji crude without discounts in a competitive market in Japan.

"We don't know of any crude sold there that isn't at least 12¢ off posted prices," these sources said.

Further, they also doubt that Arabian Oil can sell the bulk of its shipments to its own shareholders. "That's why they're asking the Japanese government to force the oil industry in Japan to take 80% of their production," one oil man added.

The Japanese company is said to have wanted a more "realistic" price, low enough to compete with other Persian Gulf crudes sold in Japan at discounts and under long-term contracts, but so far have not been able to persuade the Saudi and Kuwaiti governments.

One point that is seen there as enhancing chances of sales without discounts: The crude appears ideally suited to the needs of the market. Sample analyses by several refiners in Japan show it high in yield of diesel oil, kerosine, and fuel oil, and as low as 17% in gasoline.

Meanwhile, Tariki said Saudi Arabia will shortly take 10% participation in Arabian Oil's operations, in accordance with an option in its 56-44 profit-sharing agreement.

"We are buying 10% of the shares of the company at par value as soon as oil exports start—that is, in December," he said. "This means our profit-sharing arrangement is not really 56-44, but 66-34."

The new Kuwait National Petroleum Co. is also expected to take 10% participation, similarly provided in Kuwait's 57-43 profit-sharing pact for its own undivided half-interest in the offshore concession.

ENI Makes New Pitch to Mideast

BEIRUT—Italy's ENI group is telling the Arabs that it won't need to import Russian crude if it can get more oil resources of its own in the Middle East.

This is the latest pitch to Saudi Arabia's Oil Director Abdullah Tariki in a renewed bid for Saudi oil rights. It was made here in Beirut by ENI delegates at the recent Arab Oil Congress—where ENI was charged with hurting the Arabs by its imports of Russian oil.

"We told Shiekh Abdullah we need more Middle Eastern crude," one ENI delegate told PETROLEUM WEEK. "If we could only form partnerships and work together in developing more crude resources," he added, "we won't need to import crude from the Soviet Union."

ENI renewed its offer to the Saudis of a 50-50 partnership for a concession in the preferential area of central Saudi Arabia, around Riyadh.

Tariki confirmed that the offer was not the first ENI has made for this area. "But they still prefer the type of agreement they have in Iran with National Iranian Oil Co.," he added.

"We, however, prefer the type of agreement we made in the Neutral Zone with the Japanese," the Saudi Oil Director said.

That pact provides for 56-44 profit-sharing, includes an option for 10% Saudi participation when development starts, and requires integrated oil operations.

ENI, meanwhile, has already entered a firm bid for Kuwait's offshore oil rights, and is now reported also eyeing rights in Iraq.

It is said to be interested in the small offshore area Iraq has offered at the head of the Persian Gulf, as well as onshore areas to be relinquished by Iraq Petroleum Co.

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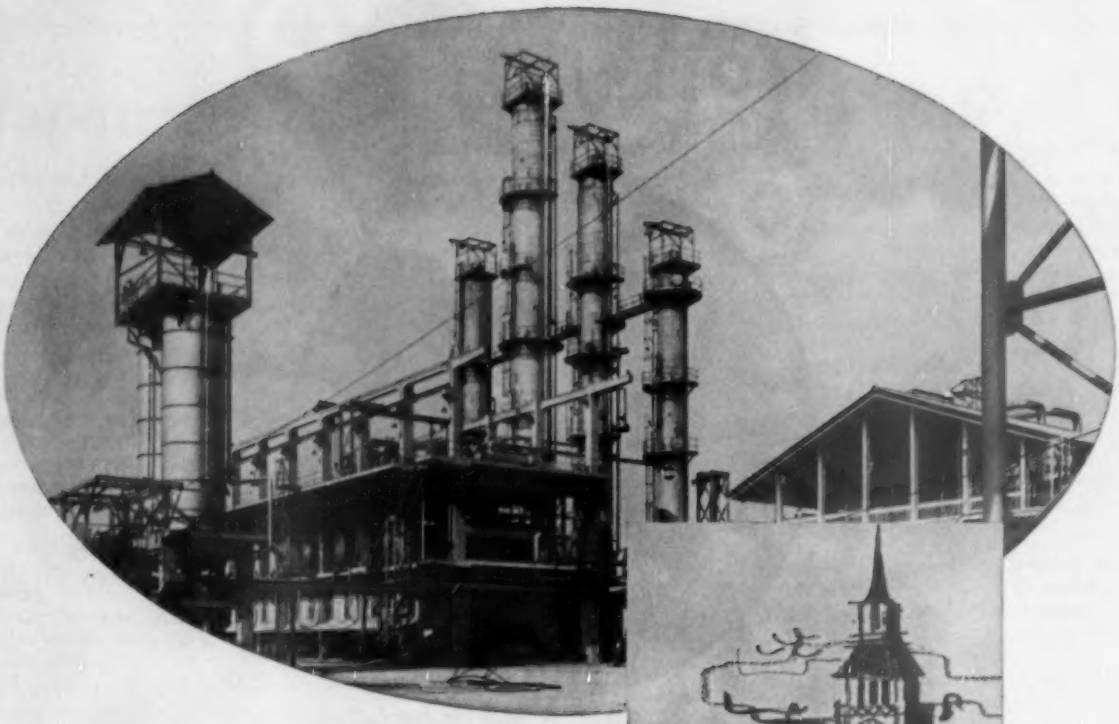

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WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, CHEMICAL AND PETROCHEMICAL INDUSTRIES

Good Year Seen for Australia Search

How many wildcats will be drilled in Australia in the next year? Twenty-five would be a low estimate, Ernest Evans, Minister of Mines for the Australian state of Queensland, declared last week.

The optimistic outlook for drilling "down under" was given by Evans in an interview with PETROLEUM WEEK in Houston, where the Australian official was visiting oil company operations.

Evans noted that there are 20 American companies, many of them small independents, and 10 Australian firms now either drilling or doing geophysical work in Australia.

Oil in commercial quantities has not yet been found in Australia, but exploration in most parts of the country has not yet got fully under way. There have been some promising gas discoveries, however.

If a sufficient number of rigs can be obtained, there will probably be ten tests drilled in Queensland alone in the next four months, Evans said.

Queensland, the state in which a large part of the Great Artesian Basin lies, is getting the biggest oil play among the newcomers who have flocked into Australia in the last year or so, Evans said.

Two and one half years ago, there were only two prospecting licenses in Queensland. Now the state has granted almost all of the available acreage, and companies seeking oil rights in the state must negotiate with present holders.

One slowing factor in the exploration picture is the lack of rigs, Evans said.

He noted there are only eight rigs now available in Queensland. There are companies in Australia that want rigs but have not yet been able to get them, according to the official.

Queensland is studying changes in its petroleum law, but Evans stressed that they would be designed to be fair for the oil operator.

"We feel that if a company goes in, explores, and discovers a natural resource, then this company should be amply rewarded for such a discovery," Evans said. "As a result, in Queensland all agreements for leases state that Queensland will receive only 10% royalty should a discovery be made. We would not change these agreements."

The Queensland act has "a whole lot of flexibility" at present, Evans declared. However, he wants it changed "to cover situations which may occur in the future so that the industry and the state will always be prepared for the day when oil is discovered."

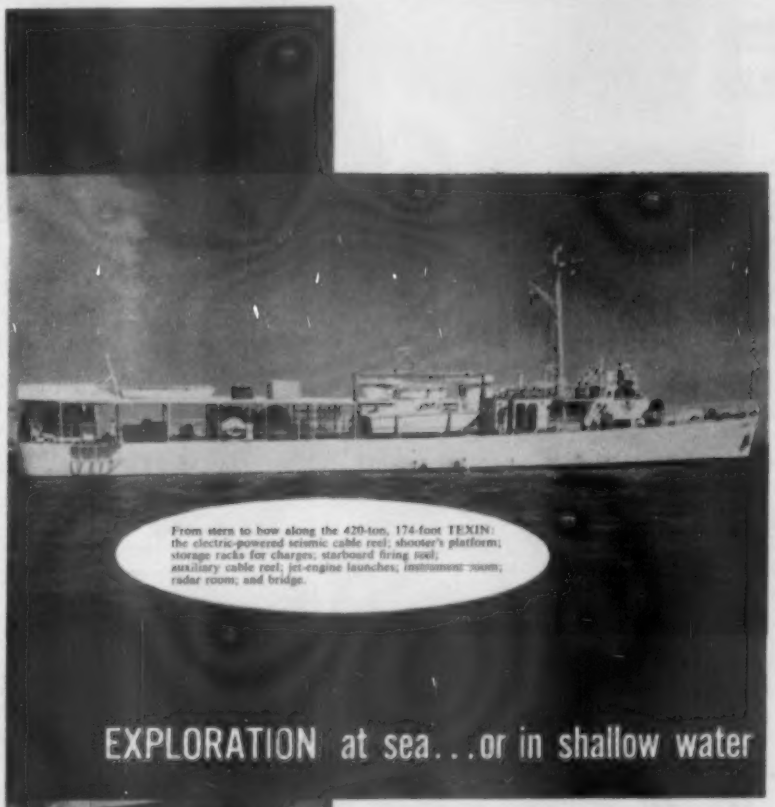
The amendments are expected to include clauses from U.S. and Canadian laws, Evans reported.

The revised law is expected to be completed and in force by next September.

Meanwhile, Standard-Vacuum and British Petroleum will withdraw Dec. 31 from a joint-venture agreement with Delhi-Taylor and Santos Ltd., after two dry wildcats.

Stanvac and BP each own interests in Frome-Broken Hill Pty., Ltd., which joined the other two firms late in 1958 in the search on acreage held by Delhi-Taylor and Santos in Queensland and South Australia.

Frome-Broken Hill, however, will continue the search on acreage it holds in its own right in Victoria.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ENI May Have Staked Out Tunisia Tract

PARIS—Enrico Mattei's ENI, in exercising the company's exploration agreement with Tunisia, is expected to pick up acreage formerly held by the French firm Serepf, according to informed sources here last week.

According to the sources, the Italian state firm wants to acquire a permit in Central Tunisia north of the area still held by Serept in a joint venture agreement with Mobil (map).

Last summer, ENI signed an agreement with Tunisia under which it will build a refinery and acquire both exploration and marketing rights in the country. However, the permit area on which the ENI search was to be undertaken was not specified then (PW—Jun.17'60,p66).

The acreage reportedly sought by ENI was returned to the Tunisian government early this year by Serept at the same time it entered into the agreement with Mobil.

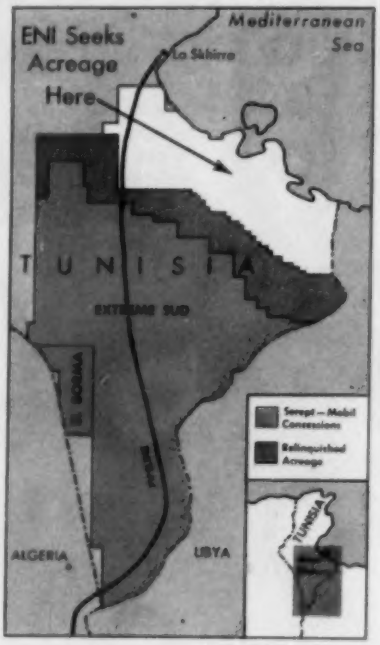
It was believed, however, that ENI was not interested in additional acreage relinquished by Serept and Mobil in early September.

The tract then returned, a portion of the Extreme Sud permit and just south of the area previously turned back by Serept, had been explored without success, the sources said.

Also last week, some of the terms of the agreement between Mobil and Serept, whereby the former gains a 50% interest in three Tunisian permits were revealed.

Mobil paid Serept $10.1-million to reimburse the French firm for a share of the money spent on exploration prior to 1959.

In addition, Mobil assumed the



whole of the 1959 exploration costs and three-quarters of the costs for the first half of 1960. The actual sums paid were not disclosed.

The financial arrangements were designed to permit Mobil to gain, as quickly as possible, its 50% share in the venture by assuming half the costs borne previously by Serept.

The Mobil-Serept agreement covers three permits, extending some 15,000 sq. mi.

So far the El Borma permit is not yet included in the convention between the Tunisian government and the two companies. But the companies expect the convention will soon be extended to the tract so that preliminary exploration can begin.

Drilling under the joint venture agreement is expected to get under way next year, with Serept as operator.

While the French firm previously did some drilling in Tunisia, it stopped its tests more than a year ago.

Serept is jointly owned by the French government's Bureau de Recherches de Petrole (52%) and the Tunisian government (30%). The remaining share is held by private French interests.

Kuwait May Favor U.S. Bidders

BEIRUT—U.S. companies bidding for Kuwait's offshore oil rights may have the inside track now, due to reported elimination of other bidders.

According to indications given to PETROLEUM WEEK in Beirut last week, priority consideration will be given to companies that accept participation of the new Kuwait National Petroleum Co., that have their own refining and marketing outlets, and that are not state concerns.

Shell and Italy's ENI are said to be out of the running for those reasons—Shell because it reportedly rejected state participation, and ENI because it is a government-owned company.

A Japanese offer was reported still incomplete as of last week (PW—Nov.4'60,p41).

Several U.S. companies are thus apparently in the lead, either alone or in group bids with others.

Among them are Cities Service, Atlantic, Phillips, Continental, and Pan American International.

Detailed study of the bids will be started next week in Kuwait.

Germany Now Second In European Markets

West Germany has moved from third to second place among the oil-consuming nations of Western Europe.

The information was contained in a recent report by Esso France, in which it analyzed trade figures for 1959 and the first six months of 1960.

Until last year, France held second place, after the United Kingdom, as West Europe's leading products user. Italy was and still remains on the fourth rung of the ladder.

But, the figures show, Germany consumed 22.3-million tons of products in 1959, pulling ahead of France whose domestic demand totaled 20.5-million tons. Great Britain maintained its lead with 33.9-million tons of products consumed. Italy's demand was 14.5-million tons.

Germany's claim to second place is bolstered by the per capita product consumption figures for the first six months of 1960.

The statistics, also released by Esso, show that Germany is 32.8% below the United Kingdom in per capita use of product. It leads France by 4.9% and Italy by 35.2%.

Esso gave the following statistics for per capita consumption in the four countries (in kilograms): U.K., 760; West Germany, 510; France, 485; and Italy, 330.

West Germany enjoys the fastest growing rate of product demand of the four nations, the Esso report showed.

Its rate of increase for the first half of 1960 was 32.5%, compared with 27.5% for Italy, and 19.6% and 11.2% for the United Kingdom and France, respectively.

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* * *

Thomas J. Robertshaw began his career with Du Pont in 1938. Following wartime Navy service as an Aircraft Finishes Specialist, he returned as Assistant to the Sales Technical Advisor in Philadelphia. In 1952 he was made responsible for Maintenance Sales in New England and upstate New York. Since 1957, he has been Central District Manager, Industrial Maintenance Sales. Among the industries for which he has solved maintenance painting problems: marine, automotive, chemical, steel, petroleum and food.

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What's New / AROUND THE WORLD

Pot Still Boils on Argentine Oil Policy

ARGENTINA—Opposition erupted anew last week against the government's policy decision to open oil rights to foreign companies on the South Flank of Comodoro Rivadavia.

The entire board of YPF, the state oil company, resigned in protest. It maintained that this area should be reserved for YPF entirely, and not merely in part as provided in the new decree (PW—Nov.4'60,p10).

Nonetheless, the government is expected to push ahead with plans that will require foreign companies—but not local bidders—to pay fees to YPF for new rights, including payment for past exploratory work and a levy based on extent of reserves.

•

VENEZUELA—Sun Oil has tapped the deepest production in Venezuela with a well on Lake Maracaibo Block 12. Its SLG-12-7 tested 1,013 b/d of 34.1-gravity crude from 15,449-530 ft. through ⅝-in. choke. Drilling is continuing.

•

SPANISH SAHARA—A stratigraphic test—the first hole ever drilled in this territory in the search for oil—has been abandoned by Gulf Oil at 1,800 ft., where drillers hit basement rock. The rig has been moved from the Block 9 site to a site near Tafalla, on Block 10, where a second stratigraphic test is being drilled.

•

UNITED KINGDOM—Esso's British refining capacity has been boosted to 145,000 b/d with official opening last week of its new 100,000 b/d plant at Milford Haven. The $50.4-million refinery is currently operating on Middle East crudes at about ⅔ of capacity. Output, Esso said, will be absorbed by the growing demands of the UK market.

•

SUDAN—Shell and British Petroleum are weighing a proposal for a joint $16.8-million refinery in the Sudan. They began study of the project last year after—as established marketers there—they were invited by the Sudanese government to submit a counterproposal to a refining bid from Italy's ENI (PW—Oct.23'59,p45).

•

JAPAN—Fuel oil prices in the Japanese market—now well above the world market price—will be cut in stages. The first will result from a compromise between refiners and major utilities, which are dropping demands for their own foreign exchange allocations for oil imports. The price of Special C fuel will be cut by $1.11 per kiloliter (6.29 bbl.), to $20.83.

•

EGYPT—Italy's ENI has reportedly offered only 30% Egyptian state participation in its bid for Western Desert oil rights—in contrast with its usual 50-50 partnership offers elsewhere. Pan American International and the Shell-BP affiliate in Egypt are the only others known to have submitted firm offers so far (PW—Oct.21 '60,p84).

•

INDIA—Four more U.S.-built drilling rigs are being delivered to India's Oil & Natural Gas Commission, making a total of six purchased this year for operations in its Cambay oil area (PW—Apr.29'60,p42). The latest are complete trailer-mounted Mid-Continent units—two U-34's and two U-36-A's—shipped from Houston by Mid-Continent Supply Co.

•

NETHERLANDS—Sites 5 to 10 mi. offshore have been picked for the three Jersey Standard-Shell wildcats to be drilled next year in the North Sea (PW—Apr.29'60,p42). Application to drill the tests in extraterritorial waters off the coast between Noordwyk and Kykduin has been filed by NAM, the joint Jersey-Shell producing company in Holland.

•

THAILAND—The government is inviting formal bids by Dec. 3 to build a 28,000 b/d refinery under terms similar to those proposed by Indiana Standard, which recently withdrew its bid.

The plant must be turned over to the government after a yet-unstipulated period to be set by negotiation.

•

QATAR—Gas produced with oil by the Iraq Petroleum affiliate in Qatar will be used for the first time next spring when the government completes a 60-mi. gas pipeline system from the Dukhan field.

The 10- and 6-in. network will carry about 20-million cu. ft. of gas daily to power stations, and other installations at Doha, the capital. Pencol Ltd., of London, will design and engineer the network.

Mideast Oil Output Sets More Records

Middle East oil output climbed more than 13% in the first nine months of 1960, boosted by record levels reached by all four major producing states in September.

The month brought new highs for Iraq, Iran, and Saudi Arabia. And Kuwait output—which henceforth will be announced only on a quarterly basis—jumped 140,000 b/d, nearing its record, set last May, of 1,787,269 b/d.

Kuwait, up 15.9%, led the gain for the nine-month period, with Iran showing the lowest rate of increase among major producers.

The comparative totals, in 000 b/d:

	Sept. '60	9-Mo. Avg. 1960	9-Mo. Avg. 1959	Percent Gain
Kuwait	1,729.1	1,612.1	1,390.5	15.9%
S. Arabia	1,249.1	1,213.2	1,073.1	13.0
Iran	1,106.0	1,005.8	907.0	10.9
Iraq	1,043.3	951.3	829.2	14.4
Qatar	174.7	173.9	172.6	0.7
Neutral Zone	139.5	130.9	114.3	14.5
Totals	5,441.7	5,087.2	4,486.7	13.4%

Why Solar designs industrial gas turbines to weigh between 1 and 1½ lb/hp

by Paul A. Pitt

Chief Engineer
Solar Aircraft Company

The weight of Solar gas turbines is the result of a design philosophy that is unique in the small gas turbine field.

Most gas turbine designs fall into one of two extreme categories. Aircraft-type engines, at one extreme, embody highly sophisticated techniques for extreme light weight in relation to horsepower, but have resulting short life. The opposite philosophy employs the ultra-massiveness of steam turbines to assure long life.

There are important disadvantages in both approaches when long life, reasonable cost, dependable operation, simple maintenance and easy transportation and installation are required. While aircraft-design engines (of ¼ to ⅛ hp/lb) can be modified and derated for longer service life, the resulting product is inherently delicate. This compromise inevitably results in short life.

Paul A. Pitt

On the other hand, massive design (of 10 lb/hp and up) leads to unnecessary structural bulk and introduces problems of thermal lag and distortion.

Since World War II, Solar has designed and built a variety of gas turbine units with characteristics that lead to both long life and low weight. The Saturn gas turbine engine, for example, is an 1100 hp unit intended specifically for industrial and military installations. It has a weight-to-power ratio of 1.1 to 1.4 lb/hp.

Although it is designed for long life, it utilizes only enough materials in its components to satisfy structural and thermal requirements. This approach resulted in a design that makes no compromises with durability and performance, yet meets the needs of industry for flexibility in a small package. It has an 1100 hp rating at a specific fuel consumption of 0.61 lb/hp-hr and a continuous rating of 1020 hp at 0.63 lb/hp-hr SFC.

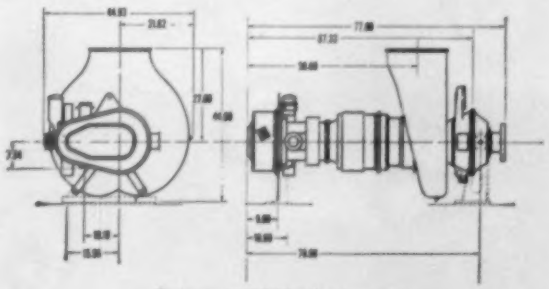
Meeting these objectives required an engine with a simple thermodynamic cycle and high efficiency components. An axial compressor was designed with an operating efficiency of 86%, and this was combined with a multi-stage, axial type turbine of advanced aerodynamic design. Over-all dimensions of the engine are shown in the figure below.

To fulfill workhorse service requirements, the engine was designed to operate at a conservative gas temperature of 1450 F continuous rating. The stress levels are also low, so that major rotating and stationary components will have more than 100,000 hours of life with long periods between overhaul. To keep costs down and assure dependability, the engine design is simple and straightforward.

In brief, the development program of the Saturn turbine adhered to three principles: Careful aerodynamic design for high performance; use of moderate temperatures and low stress levels for long life; and exhaustive component testing for ruggedness and reliability.

Presently scheduled field applications of the Saturn turbine include: Power source for 750 kw electric generator sets in process plants, portable field equipment, pipeline pumping, and gas compression in the petro-chemical industry. Other uses are as a power source for a 600 kw generator set in a commercial marine installation, propulsion units for marine and amphibious vehicles, and prime movers for off-highway vehicles.

Detailed data on Solar gas turbines and other turbomachinery is available. Write Dept. H-176, Solar Aircraft Company, San Diego 12, California.



Saturn T-1000 dimensions

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What's Wrong with Oil Merchandising?

Oil marketers have come under fire again for the way they sell gasoline. This time the attack was fired by E. B. Weiss, director of special merchandising services at Doyle-Dane-Berbach, Inc.

In a blistering talk, Weiss said that service stations have changed less than any other basic type of retail outlet in the past 10 years.

He called the merchandising techniques used at service stations "worse than pathetic."

"No industry does such a poor job with advertising," he added.

Weiss spoke at the 6th Seminar in Retailing for Petroleum Executives, which concluded its 2-week session last week at New York University.

His remarks were received good-naturedly by the 18 executives attending the session.

The purpose of the seminar is to help petroleum executives in middle marketing management evaluate their retailing techniques in light of developments in other industries.

Weiss charged that oil marketers have failed to capitalize on the fundamental advantages of the service station.

Here are some of the advantages that Weiss cited:

- Service stations generally have the best retail locations in town.
- They're open longer hours than most stores, especially during the night and on Sunday.
- Children probably enter service stations more often than they enter any other retail outlet.
- Stations have the benefit of widely established credit facilities.
- When a motorist is anchored to the pump while buying gasoline, he is a "captive customer."
- Service stations probably enjoy the greatest shopping traffic of any other type of retailing.

In view of these advantages, Weiss said that it is "almost criminal the way service stations let customers slip through their fingers." He guessed that stations have an average sale of $2 per customer, which is perhaps the lowest rate of any comparable chain of outlets.

It all stems, he said, from the failure of the oil industry to recognize the motorist as a shopper: a shopper who buys impulsively, who shops less often than in the past but buys more at each purchase—a shopper who prefers one-stop shopping.

Instead of catering to shoppers, service stations actually make it hard for people to buy, Weiss claims.

The requirement of having to sign a credit card invoice is an example. "If I can call across the continent or to Europe without having to sign my name, why can't I buy a tank of gasoline the same way," Weiss asked.

He warned that service stations, with their "dull, unimaginative, and archaic" merchandising techniques, will lose out to the new competition of fast-moving chain stores that are rapidly invading the automotive market, including the sale of gasoline.

He cited the closed-door discount chains (in which customers must apply for a card in order to buy) as "fastest growing form of retailing today." He said these chains are expanding into gasoline sales.

What can be done? Weiss strongly advocates the diversification of the service station, patterned after the development of modern supermarkets and drug stores.

He predicted that by 1965, 50,000 service stations will have become important outlets for nonautomotive products.

He disputed the "strange logic" of suppliers who fear that an increase in nonautomotive sales at service stations will cause a decrease in gasoline sales. The supermarket "sells everything under the sun," he said, without jeopardizing food sales.

Much of the diversification at service stations, Weiss suggested, will take place through increased use of vending machines. Such a development would coincide with the coming era of self-service retailing, which has already dominated the variety chains and drug stores and even permeated whole sections of department stores.

The service station "is the logical location for vending machines," said Weiss, because of its convenient locations and long hours.

But before the emergence of diversification of service stations, Weiss offered a myriad of ways in which oil marketers could step up the quality of their merchandising.

His ideas included the following:

- Expanded point of sales promotions at the pump island, similar to the approach taken by supermarkets at their check-out counters.
- Increased use of premiums, especially the kind that bring motorists back for more—one dish at a time, for example.
- Diversification into toy sales. The service station could be "a year-round outlet for toys," he said.
- Extension of credit-card priv-

The "New Mobil Look" Arrives in England

This service station design, which was first introduced in Venezuela (PW—Nov. 6'59,p82), incorporates Mobil Oil Co.'s identification symbol into the facade of the building. Station shown here is in Shepperton, England. At present, Mobil is also importing the design into this country. The first U.S. station with the "New Mobil Look" is located in Westchester, N.Y.

ileges to motorists—without the red tape of credit clearance. Weiss mentioned a Chevron station that had done this with apparent success.

• Broader use of credit cards. He referred to the insurance service being made available by Standard Oil Co. (Ind.) to its credit card holders. He called this a step in the right direction.

• Advertising with the monthly credit card statement. Weiss said that department stores stuff their monthly envelopes with advertising, but oil companies send nothing but the bill.

• Greater experimentation with prices. Weiss recommended combination prices for a car wash, lube job, and motor oil change to stimulate increased sales at the station.

• A booklet on how to save gasoline. Oil companies promote economy runs, Weiss said, but they never reveal how the average motorist can get the most mileage from his gasoline. A booklet on this subject would promote goodwill, he predicted.

Carmaker Criticizes Motor Oil Markings

Oil marketers were criticized last week for disregarding the apparent intent of API's service classification for motor oils.

The criticism was voiced by three General Motors executives in a talk presented before the Society of Automotive Engineers in Tulsa.

The GM executives were P. A. Bennett, G. K. Malone, and C. K. Murphy, all of the fuels and lubricants department of GM's research laboratories.

Specifically, oil men were accused of including a broad range of motor oils under what carmakers consider API's severest service classification.

Oils designated for Service MS (most severe service), the GM men feel, should indicate "the best available lubricants."

In practice, however, oils marked for this service range in quality "from straight mineral oils to products that are more than adequate," they said.

To narrow down the definition of API's service classification, the big three carmakers designed five engine sequence tests for motor oil.

These tests were developed in 1958, and have been used ever since by carmakers and oil companies as a guide in predicting motor oil performance.

Ford Motor Co. has gone furthest in relying on the tests as an indication of oil quality. It is recommending to

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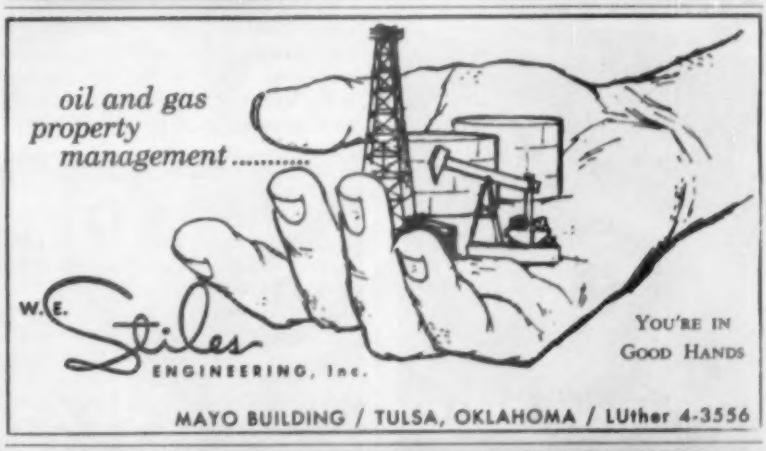
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its customers that they use only those oils that are marked "engine sequence tested," or some similar designation. Many oil companies have cooperated with this recommendation by labeling their "tested" oils.

Last week, the sequence tests were praised by one major oil company that has found them "superior" in "predicting certain performance properties."

This was the conclusion of C. C. Colyer and T. B. Tom, two executives in the research and development department of Standard Oil Co. (Ind.), who talked before the SAE in Tulsa.

"Another, and a very important, feature of the MS test," the oil men said, "is that it provides a common language for discussing oil performance among petroleum and automotive companies and with mutual customers."

Carmakers have repeatedly urged oil marketers to revise the API service classifications, perhaps to bring them more in line with Detroit's test sequences.

But the oil industry has generally opposed this suggestion. Mainly, oil marketers are hesitant to impose any changes on the classifications that would tend to bring about a ranking of oils in terms of quality.

Many oil marketers oppose this move because they feel that the service classifications provide a much better guide to oil performance than the test sequences do.

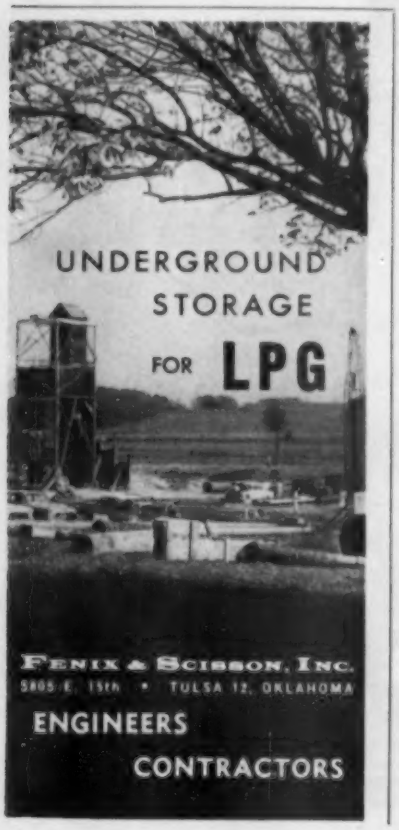
"The term for Service MS is much stronger and more meaningful than any reference to the sequence," says Dr. Oscar C. Bridgeman, technical consultant to the research division at Phillips Petroleum Co.

"Oil correctly designated for Service MS meets all known requirements for this type of service," he said in a talk before the Independent Oil Compounders Assn. earlier this fall.

The sequence tests, on the other hand, "are keyed to special requirements," he said.

He urged carmakers to show patience in waiting for oils to catch up with the changing requirements of today's new cars.

He admitted that, in the present transition period, "some ambiguity may exist as to whether oils designated for Service MS meet all requirements of the new severity levels." But he said that this period is rapidly drawing to a close and "For Service MS" will again "have overriding significance."



What's New / IN MARKETING

San Francisco dealers are being advised to stop giving trading stamps on gasoline, in order to comply with the recent ruling on stamps.

The San Francisco Petroleum Retailers Assn. is also advising its members that it is permissible for them to continue to distribute stamps for oil, lubes, TBA, and minor repair services.

If California dealers advertise stamps along with the sale of gasoline, they have to post the price of the gasoline minus the value of the stamps. This is the effect of a ruling issued by the state attorney general, Arnold Mosk.

•

Northwestern Refining Co., of St. Paul Park, Minn., plans to build 1,000 Superamerica service stations at the rate of 100 a year.

This expansion program, which will cost $22-million, will be centered in a nine-state area stretching from North Dakota to Illinois.

The first Superamerica station was opened in January in St. Paul. Two others have been built since then, and nine more are to be completed before the end of the year.

•

The shift from large cars to compact autos has produced one major casualty: The De Soto will be discontinued next month.

The last De Soto will come off the Chrysler Corp. production lines on Dec. 20, industry sources say.

•

Shell Oil Co. is moving back into the Dallas-Ft. Worth market.

Shell hasn't marketed in the area since the 1930s. But it has now established a district sales office there to direct the marketing of products from its Houston refinery.

Currently Shell markets in only a limited number of Texas markets, including Kilgore, Houston, Victoria, and Odessa.

Insurance Sideline

The first insurance vending machines (PW—Sep.30'60,p44) began appearing at service stations in Dallas and Ft. Worth early this month.

The portable device offers motorists a maximum of $2,000 in life insurance, with up to $5,000 in accidental benefits. The insurance is good for seven days, and is available to everyone for a top price of four quarters a week.

World Land Corp. of Denver, the originators, says dealers do not act as insurance agents: They just "make the insurance available."

NOW reduced prices make it even thriftier!

'61 CHEVY CORVAIR

Keeping costs down is a fine art with most businesses—and nobody's more aware of it than Chevrolet. Which is why we've come up with some important news about Corvair for 1961.

To begin with, prices have been reduced on all coupes and sedans. (Your dealer will be glad to tell you exactly how much.) Enough said.

What's more, a new rear axle ratio, quicker-than-ever cold-start warmup and other improvements help make Corvair a more practical buy than ever.

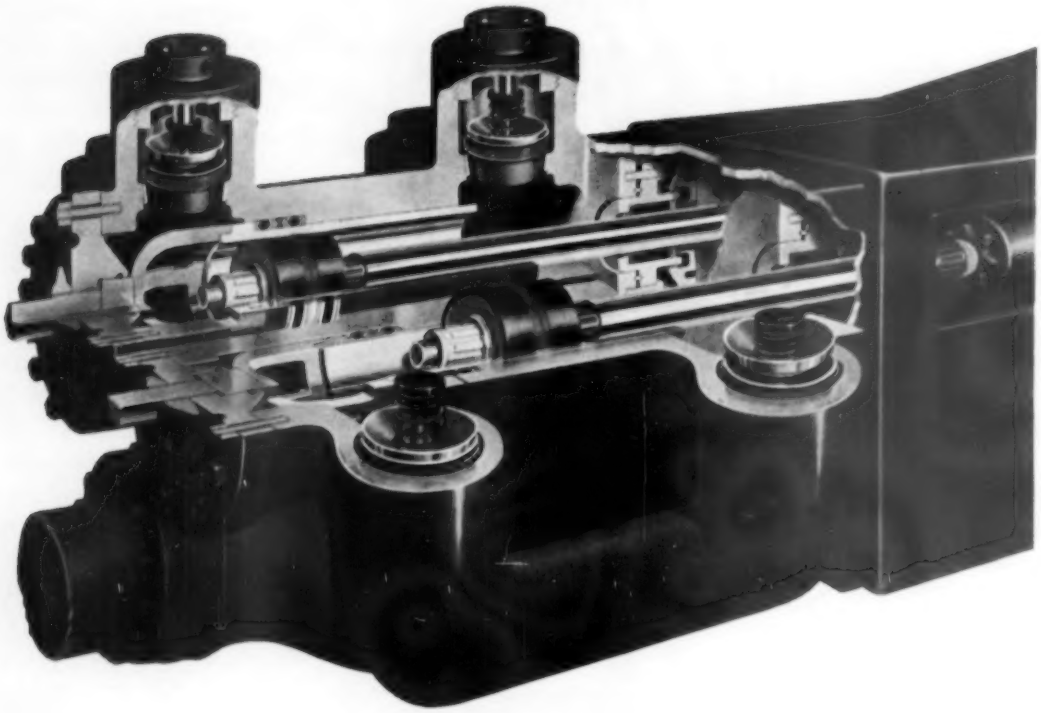
Under the hood, you'll find nearly 12% more cargo capacity, too. Along with all of the refinements you'll enjoy in the '61 Corvair, you'll appreciate the traditional virtues that have become a trademark with us: that air-cooled rear engine (never needs antifreeze), the traction, the nimble handling that makes driving easier.

Give Corvair a chance to show you what it can do for your balance sheet. Your Chevrolet dealer's the man to see. (And by the way, you might well be interested in Corvair's wagons—the Lakewood and the intriguing Greenbrier. Check them both out while you're getting the short, sweet details about Corvair economy at your dealer's.) . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

corvair
for economical transportation

The "Inside Story" of the Heart of Your Rig

. . . by MISSION



This cutaway view of a mud pump shows where the vital Mission fluid-end parts fit and why they are essential to correct operation. Forces on these parts are staggering. For example, pistons and rods may be subjected to forces of more than 100,000 pounds.

Liner packing and gland packing may be exposed to pressures exceeding 2000 psi, and valves and seats are required to stand violent impact every time they close.

Liners, also, are subject to "rocking," which aggravates both piston and liner packing wear unless all critical liner dimensions are held within API specifications.

These forces may be multiplied by shock loading at times, and they are completely reversed at least once every second. When you remember that mud may contain abrasive sand to cut metal parts, corrosive chemicals to pit them, and oil to attack rubber, it seems obvious that only the best pump parts stand a chance.

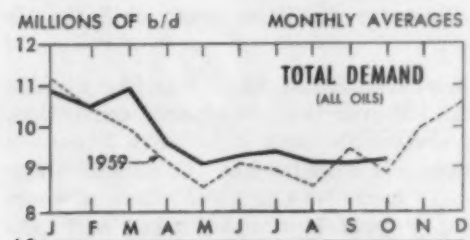
These Mission Pump Parts are in direct working contact with the drilling fluid, so it is easy to see that they are vital to correct pump operation. When you remember that they work together for trouble-free service, it makes sense to specify *all* Mission Pump Parts—exclusively—in all your pumps. Your pumps will perform better, require fewer repairs and cost less to maintain when you do. The famous Mission Guarantee assures you of this service.

For over thirty years—quality built in to last MISSION MANUFACTURING CO.

MISSION MANUFACTURING CO. P. O. BOX 4209, HOUSTON, TEXAS • CABLE ADDRESS "MISSCO" • EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK
IN THE UNITED KINGDOM: **MISSION MANUFACTURING CO., LTD.**, 1 HANOVER SQUARE, LONDON W. 1 ENGLAND • CABLE ADDRESS "MISSOMAN"

PETROLEUM WEEK'S

Fingertip Figures



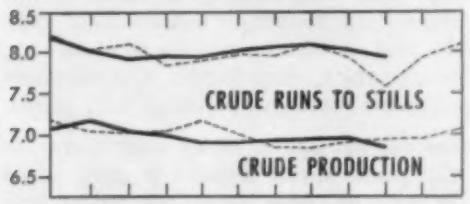
Figures for period ended Nov. 4, except as noted

TOTAL DEMAND

Latest 4-week average	*
Year ago	9.219

DISTILLATE DEMAND

Latest 4-week average	*
Year ago	1.931

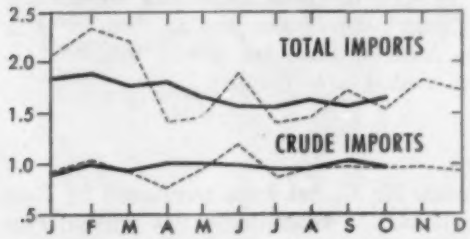


RUNS TO STILLS

Latest week	*
Previous week	7.934
Year ago	7.681

CRUDE PRODUCTION

Latest week	*
Previous week	6.821
Year ago	6.899

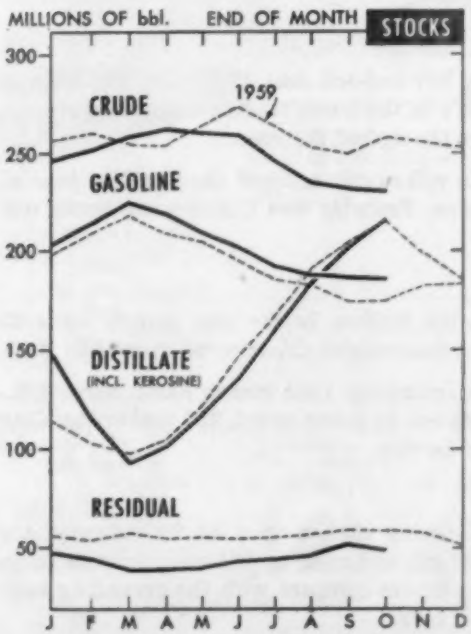


TOTAL IMPORTS

Latest week	*
Previous week	1.518
Year ago	1.318

CRUDE IMPORTS

Latest week	*
Previous week	.899
Year ago	.753



CRUDE STOCKS

Week-ended Oct. 29	230.8
Previous week	229.8
Year ago	256.3

GASOLINE

Latest week	*
Previous week	186.8
Year ago	175.8

DISTILLATES

Latest week	*
Previous week	215.6
Year ago	214.4

RESIDUAL

Latest week	*
Previous week	49.9
Year ago	57.7

When API meets in Chicago next week, a good subject for the Committee on Petroleum Statistics to mull over is the inclusion of natural gas liquids production in weekly reports on production.

Over the past several years, gas liquids obtained by processing natural gas in cycling and natural gasoline plants, along with field condensate, have been playing an increasingly important part in the raw materials supply picture.

So far in 1960, gas liquids production has averaged more than 920,000 b/d. Yet this substantial amount is not tallied in API's figures, even though the latter includes some field condensate.

Gas liquids account for roughly 11.6% of total domestic liquid hydrocarbon production. A factor of these proportions must be taken into account to reach a realistic figure on supply.

Last year, output of natural gas liquids scored an increase of 9.7%, over 1956 compared with a dip of 1.4% for crude.

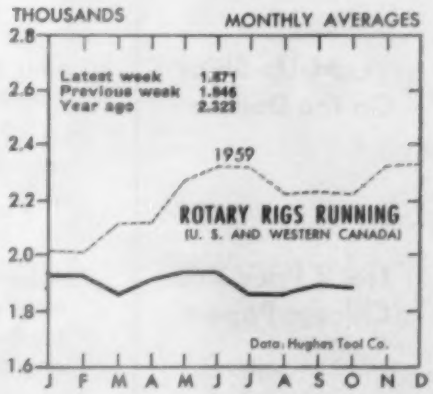
A new analysis of the balance between petroleum supply and demand (page 22) shows that NGL production rose from 801,000 b/d in 1956 to 879,000 b/d last year, an increase of 78,000 b/d.

Significantly, the increased supply of natural gas liquids is making itself felt in the demand for domestic crude.

The study also shows that domestic crude production last year fell 97,000 b/d from 1956 levels. Thus, it's apparent that the increase in NGL availability has been steadily displacing crude in refineries.

* * *

*Due to the Election Day holiday, most figures for the week ended Nov. 4 were unavailable at press time.



The Market Trend

. . . and a Happy Convention to You

Good markets and good earnings reports make for a good convention. So the API meeting should be a friendly, jolly place to be this year. Even the price setback on the East Coast for distillates won't chill the air too much.

Remember the 1958 convention? The Hilton lobby was like a wake. Depression in the market place can kill even the best-planned convention. Crude prices were being snipped—seemingly on a daily basis. Discounts on crudes of 50¢ a bbl. were common. Distillates had the shakes. Gasoline prices were weaker than a cat's back. No one knew when or where some whirlwind gasoline price war would blow down retail and tank wagon prices. Mention a low price on anything and some one gloomily came up with a lower one. Oil was a disenchanting business.

Smiles should be broad this time, and handshakes firm. From now on out things look good. With October behind, November half gone, and December looking like a good month, everything adds up to a good fourth quarter. Crude stocks are down more than 20-million barrels from 1958 and can't rise before the end of the year at the earliest. Gasoline is long, but not in trouble—inventories mostly are in firm hands. And suppliers see nothing ahead that could undermine wholesale residual fuel prices.

It is true that distillate prices are subject to sharp controversy in some areas. But the arguing really points more to what is good about these markets than what's bad. In spite of the 0.3¢ setback for heating oil along the East Coast, Gulf Coast refiners are just as firm in their price ideas as they were when Atlantic Seaboard prices advanced in September. The "Gulf low" is an unshakeable number.

Another Fuel Firm Sells Out:

Oil Heat Engineering, of the Bronx, N. Y., has been purchased by Esso Standard. Oil Heat's annual gallonage is estimated at 6.5-million. Purchase price has not been disclosed.

U.A.R.'s Deal Is Still Open:

The United Arab Republic's big buy-and-sell deal (PW—Oct.7'60,p94) is still up for grabs. Right now it's in the horse trading stage, and awards may not be forthcoming before the end of the year.

Best guessing now is that Russia will supply some of the 2-million tons of crude, plus much of the kerosine. Probably two U.S. internationals will participate also.

Laid-Up Ships On the Decline:

Tanker tonnage in lay-up is on the decline. In the past month, some 65 vessels totaling 1-million tons deadweight disappeared from idle fleet.

Much of the decline was due to scrapping. Last month alone, some 425,000 tons were sold for the breakers. At latest count, 253 tankers totaling about 4-million tons are out of service.

No. 2 Price Ads In Chicago Papers:

Chicago's retail No. 2 market is being shaken up a bit by cut-price ads offering at 11.5¢ for lots of 400 gal. and over, or 13¢ on quantities ranging from 200 to 400 gal. These figures compare with the prevailing tank wagon of 14.6¢ for 400 gal. and over.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of November 7

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem 12.25-13.25
- Gasoline, 92 oct reg 11.25-11.5
- Kerosine 9-10
- Heating oil, No. 2 ..... 8.25-9
- Gas oil, 48-52, d.i. 8.5-8.875
- Fuel oil, bunker "C" $2.30

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 14.75
- Gasoline, 93 oct research prem 11
- Gasoline, 87 oct research reg 10.125
- Gasoline, 80 oct research 9.375
- Gasoline, 70-72 oct motor method 9.25
- Kerosine 9.25
- Heating oil, No. 2 ..... 8.125
- Gas oil, 48-52 d.i. 8.375
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- **Kerosine ..... 10.1-10.2↓**
- **Heating oil, No. 2 ..... 9.1-9.2↓**
- Fuel oil, No. 6 ..... $2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg 12.5-13.25
- Kerosine 10.5-10.625
- Heating oil, No. 2 ..... 9-9.25
- Fuel oil, No. 6 ..... $1.80-1.90

Chicago, bulk
- Gasoline, 92 oct reg 12.625
- Heating oil, No. 2 ..... 9.5-11.35
- Fuel oil, No. 6 high sulfur 7.65

Los Angeles, rack
- Gasoline, 88 oct reg 11-12.65
- Diesel fuel, PS 200 ..... 7.75-11.25
- Light fuel, PS 300 ..... $2.90
- Heavy fuel, PS 400 ..... $2.05-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- Propane, Oklahoma (Group 3) 4.5-5
- Propane, Baton Rouge 5.625

Pennsylvania Lubes
- Bright stock, 25 p.t. 25
- 200 vis. neutral, 25 p.t. 28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. 26-27
- Neutral, solvent, 200-210 vis. 23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 26
- Neutral, solvent, 200 vis. 23

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130 ..... 15.5
- Gasoline, 79 oct research 9.125
- Kerosine 9.625
- Gas oil, 48 d.i. minimum 8.75

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9 .... $2.69-2.97
- North Dakota, 36.0-36.9 ..... 2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 .... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N.M., inter., 36.0-36.9 ..... 2.93
  - West Texas, N.M., sour, 32.0-32.9 ..... 2.71
  - East Texas, flat 3.05-3.25
  - Mirando, 28.0-28.9 ..... 2.96-3.31
- Illinois Basin, flat 3.00-3.05
- Pennsylvania Grade, Bradford dist., flat 4.80
- California, Signal Hill, 21.0-21.9 ..... 2.33†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.72-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ..... 2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.) $2.38
- Leduc-Woodbend (Alta.) 2.53
- Redwater (Alta.) 2.42
- **Steelman A (Sask.) ..... 2.425↓**
- **Virden (Man.) ..... 2.285↓**

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz $3.10
- Oficina, 35.0-35.9, Puerto la Cruz 2.80
- Tia Juana, Medium, 26.0-26.9, Amuay 2.30
- Bachaquero, flat, La Salina 1.85
- Lagomar, 31-31.9, Cardon 2.55
- Lagunillas Heavy, flat, La Salina 2.07

†*Differential per deg. of grav. varies*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.80
- Safaniya, 27.0-27.9, Ras Tanura 1.47
- Iran, 34.0-34.9, Bandar Mashur 1.78
- Iran, 34.0-34.9, Abadan 1.73
- Iraq, 35.0-35.9, Fao 1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.59
- Qatar, 41.0-41.9, Umm Said 1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud 1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud 1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud 1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon $2.17
- Iraq, 36.0-36.9, Tripoli, Banias 2.21

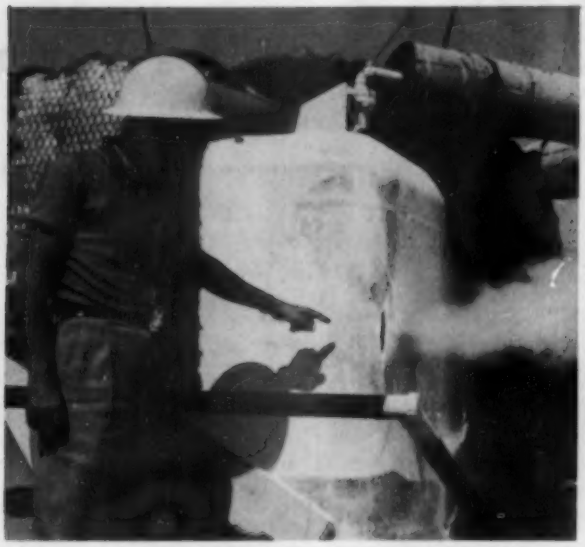
North Africa, Phillipeville, Algeria
- Hassi Messaoud, 48 and above ..... Withdrawn

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean (USMC—17½%) $2.35↓
- U.S. Gulf-New York, dirty ..... (USMC—15%) $2.42
- NWI-USNH, dirty ..... (USMC—45%) $1.51
- NWI-UK/Cont., dirty ..... (Scale—55%) 14/9*
- Persian Gulf-UK/Cont., dirty ..... (Scale—40%) 35/7*
- Persian Gulf-USNH, dirty ..... (USMC—65%) $4.45

*Sterling



STEEL-NICKEL ALLOY splits only after repeated, heavy blows.

AT 136,000 PSI., tank finally bursts, but doesn't shatter.

Cheaper Tanks for Liquefied Gases

The cost of building tanks to store or transport liquefied gases at temperatures down to around —320F may be cut substantially as the result of tests showing that use of 9%-nickel steel permits elimination of several costly fabrication steps.

The alloy is suitable for making tanks to store or ship such gases as ethylene, which liquefies at —154.8F; methane, which liquefies at —258.6F; oxygen, —297.3F; and nitrogen, —320.5F.

The steel, which contains 9% nickel and minute quantities of five other elements, was developed in answer to a demand for an alloy of high strength and ductility for low-temperature uses.

Since then, the metal has been used in the construction of more than 200 vessels to store liquids at extremely low temperatures.

Tests designed to stress tanks to failure have been conducted by International Nickel Co., Chicago Bridge & Iron Co., and U.S. Steel Corp.

International Nickel is the developer of the 9%-nickel steel.

The plates for the tanks used in the demonstration were made by U.S. Steel.

Chicago Bridge then fabricated the tanks.

Purpose of the tests was to show that a cheaper method than is recommended by code-making bodies could be used to make tanks that would withstand actual stresses far exceeding design stresses.

Perhaps the biggest problem in developing an alloy for tanks to store methane and other gases as liquids was to find one that would not become brittle at temperatures far below zero.

When a metal becomes brittle enough, it is likely to fracture under impact, a great danger if it is used for the shell of a vessel containing a highly volatile liquid.

The 9%-nickel steel alloy maintains high ductility at very low temperatures, however. Nonetheless, its use is still governed by specifications which, its users feel, are excessive.

Codes require a heat-treatment method known as double-normalizing and tempering for making all 9%-nickel steel plate, and specify stress-relieving for all tanks to be used at a temperature of —320F.

The heat treatment is set out in the code of the American Society of Testing Materials.

The provision requiring stress-relieving of tanks to be used at —320F has been laid down in the Boiler & Pressure Vessel Code of the American Society of Mechanical Engineers.

Of five cylindrical tanks made of 9%-nickel steel that were tested to failure by filling them to bursting with liquid nitrogen (—320F), two that had not been stress-relieved withstood higher stresses than three that had.

FRACTURE in cylindrical tank shows no dangerous fragmentation of walls.

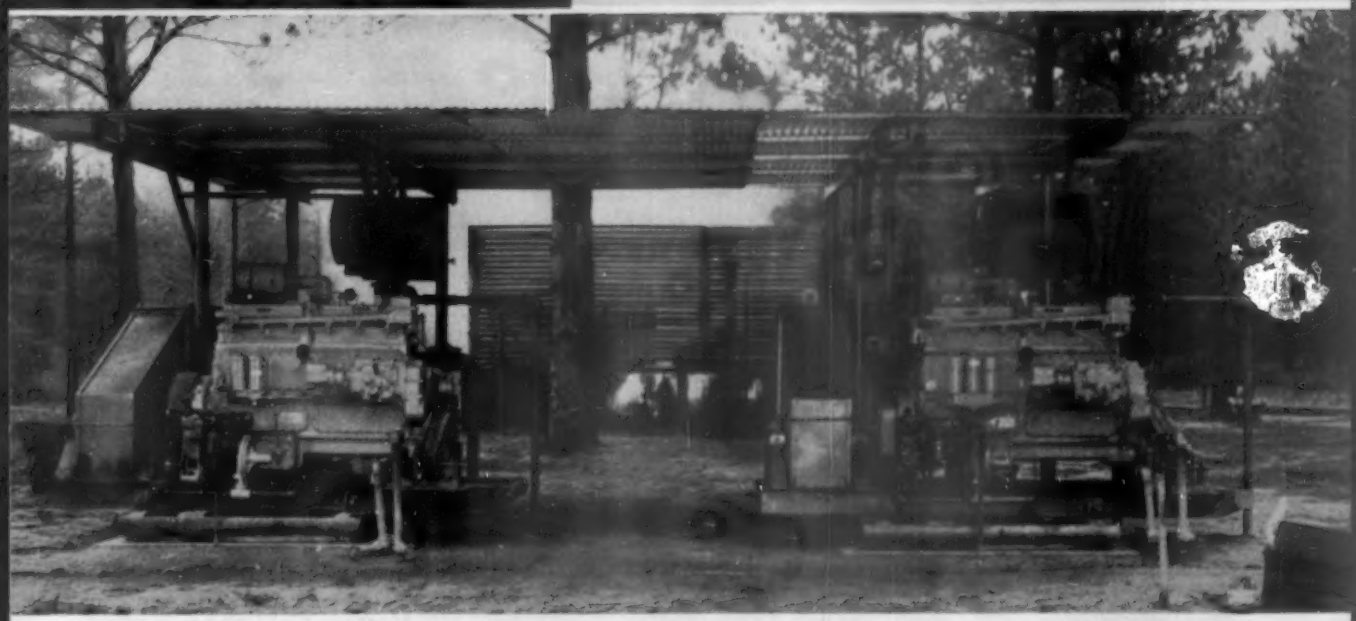
Burst stress of the two untreated tanks was 136,000 psi., about six times greater than the design stresses of the two grades of 9%-nickel steel alloy—22,500 psi. for Grade A, and 23,750 for Grade B, respectively.

The three companies who sponsored the test say it demonstrated that tanks made of alloy could be safely used at temperatures as low as —320F without first stress-relieving them.

The process of stress-relieving a tank consists in heating it to equalize stresses caused by welding. This proc-

engine power BY CATERPILLAR

CAT G342–WORLD'S LOWEST COST GAS COMPRESSOR ENGINE



Two Cat G342 Natural Gas Engines power Worthington Compressors, picking up low pressure flare gas from treaters and separators for delivery into United Gas Pipeline Co.'s sale line. Greenwood Gas Gathering Co., Shreveport, La., is the owner. Cat Natural Gas Engines need no derating.

BUY IT–RUN IT–MAINTAIN IT–FOR LESS

Buy a gas compressor engine on price—and *only* price—and you narrow the field to the Caterpillar G342. Buy on what's in the engine and what the engine does—and again the field narrows to Caterpillar.

Like all Cat Natural Gas Engines, the G342 is a diesel at heart, built on a basic diesel block, using standard diesel engine parts everywhere possible. Only pistons and fuel systems are changed for natural gas operation. You can operate the G342 and all Cat Natural Gas Engines continuously at full horsepower *without derating*. This is true only of Cat Natural Gas Engines. But then no other company builds natural gas engines like Caterpillar.

Caterpillar insists soft metals have no place in crankshaft journals. We induction harden ours and give them a "super-finish" which decreases wear between shaft and bearing metals. "Super-finishing" cuts friction. Cat cranks and journals are bound to outlast those of soft metals.

Take valves. We use alloys created for the high pressures and temperatures of diesels. They give exceptional service under the milder operating conditions of Gas Engines.

And which would you choose for bearings: steel backed aluminum alloy or a soft metal like babbitt or copper lead? There is no choice, we believe. In view of crankcase acids and the effects of friction, bearings have to be aluminum alloy, if the engine is going to deliver what you want it to.

The same reasoning applies to ring facings and cylinder liners. We use chrome on top rings and induction hardened, chemically treated liners. Hundreds of thousands of trouble free hours have proven Cat's ideal mating of these hardened parts fights scuffing and wear between rings and liners.

What about costs? The Cat G342 is the *world's lowest cost gas compressor engine.* Cat Natural Gas Engines have the *lowest fuel consumption per BHP of any engine in this horsepower range.* (Cat high compression gas engines will pay for themselves in fuel savings *alone* before the first major overhaul.) *Over-all operating costs of Cat 10.5:1 Natural Gas Engines are the lowest in their field.*

Insist on a Caterpillar Natural Gas Engine when ordering oilfield equipment. Your Caterpillar Dealer can tell you much more about the G342 . . . and about Cat Natural Gas Engines, in 7.5:1 or 10.5:1 compression ratios, naturally aspirated or turbocharged and aftercooled, up to 560 continuous HP. Visit him about the most unusual engine values available.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

ess considerably increases over-all fabrication costs.

Of the two vessels that weren't stress-relieved, one was made of alloy that had been treated by the quench-and-temper method—a process that is simpler and less costly than the code-specified treatment.

The other tank that had not been stress-relieved was made of material treated according to the double-normalized-and-tempered technique.

Of the remaining three tanks, all of which had been stress-relieved, two were built of material that had been double-normalized and tempered, and one of alloy that had been quenched and tempered.

The lowest burst stress values were attained by the two tanks that had been built strictly according to specifications—128,000 psi and 93,000 psi. —while the tank that conformed only to the stress relief specification burst at 130,000 psi.

Another quality demonstrated by the alloy made by the simpler method was ability to fracture under pressure without fragmenting.

The fracture in the tank that used quenched and tempered plate, and that had not been stress-relieved, is described by a U.S. Steel spokesman as "quite ductile in appearance" and "100% shear."

On the other hand, he says, "The fracture in the stress-relieved vessels showed evidence of cleavage fracture with varying percentages of shear fracture."

In a recent demonstration before representatives of the oil industry and other groups, both a rectangular tank and a cylindrical tank were dramatically tested to failure.

The test used on the rectangular tank, which was filled with liquid nitrogen, consisted in dropping a 4,350 lb. ball on it from a height of about 20 ft. Purpose was to show that a 9%-nickel steel alloy tank made according to the new method could withstand as much outside shock as a more-expensively-produced vessel.

Previously, the companies had subjected a specification vessel to the same treatment.

Result in both cases was that, after repeated drops, cracks about 8-in. long opened in one corner of the tanks. By the time this happened, however, the vessels had developed bulges of about 1.5 in. in their side faces, together with extensive deformation of inside stiffeners, showing the plasticity of the alloy.

The cylindrical vessel was tested to breaking by pressurizing it with liquid nitrogen.

The companies estimate that the cost of making tanks can be cut 10% by using their method.

"Accumulated data suggests savings of 10% of final erected costs can be expected from its advantages in welding and fabricating alone," they say in a joint statement.

No cost figures are given for the tanks, however.

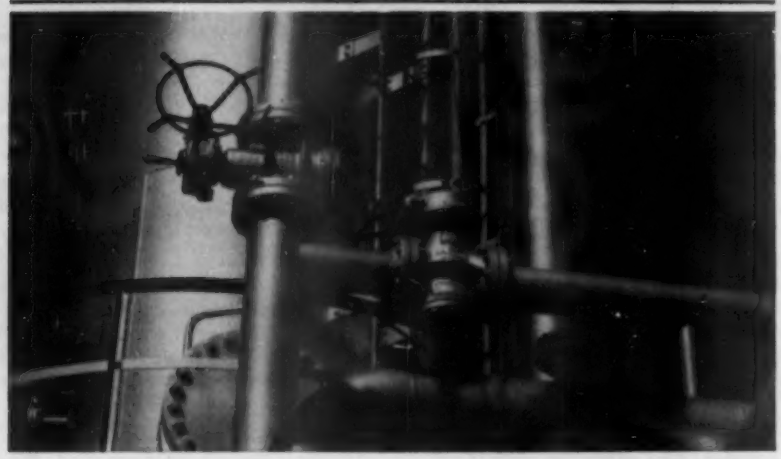
Storage engineers have estimated that cost of tank storage of liquid methane could run between $6.50 and $12.50 per Mcf.

Cost of underground storage in mined caverns is put at between 75¢ and $1.25 per Mcf. (PW—Dec.4'50, p46).

A major market eyed by the makers of the tanks are companies interested in liquefying methane and transporting it by tanker (PW—Jan. 22'60,p59).

"A specific application that holds great promise for the new material concerns low-pressure vessels for the transportation and storage of liquid methane," a spokesman says.

THE COST CUTTING SERIES . . .



LUBRICATED Valves Prove Safer

Where valve leakage is not only costly, but dangerous, lubricated plug valves assure positive shut-off. At the large natural gasoline plant (above) Rockwell-Nordstrom valves are used on high pressure gas lines. Pressurized lubricant in these valves acts as a tough, leak-proof seal without the drawbacks of metal-to-metal seats that are easily cut and quickly worn. Lubricant also prevents wearing friction for longer valve life. Where flow must be maintained without interruption, instant quarter-turn closure permits fast, dependable control. For complete details on Rockwell-Nordstrom valves and valve accessories, write:

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

Magnolia Extends Microwave System

Magnolia Pipe Line Co. is extending its Beaumont-Coriscana microwave system to Midland to bring its entire 344-mi. pipeline network from West to East Texas under remote control.

Motorola, Inc. is building the system, using its own equipment.

The western portion of Magnolia's Texas system includes a crude pipeline and a butane line.

Upon completion of the second segment, control center of the whole microwave system will be located at Dallas, 329 mi. from Midland and 276 mi. from Beaumont.

The second section of the microwave system will link ten pump stations to the Dallas control center.

They are located at Midland, Iatan, Sweetwater, Merkel, Clyde, DeLeon, Walnut Springs, Scurry, and Corsicana.

Information will be relayed from Dallas to the stations via towers being erected at Hillsboro, Walnut Springs, Dublin, De Leon, Cisco, Clyde, Merkel, Sweetwater, Loraine, Iatan, Big Spring, and Midland.

Last year, Magnolia completed an 11-tower microwave system from its

FOR EVERY PRACTICAL PURPOSE, this is the best swivel joint in the world. Its design basis is not the product of a limited applicability device, but rather of studied consideration for all applications. It is built to do the best job, with the least maintenance, for the longest period of time. It is a **CHIKSAN** Swivel Joint.

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Corsicana storage terminal to Mobil Oil Co.'s Beaumont refinery.

Under the new setup, it will be possible for one man at Dallas to control operation of all stations on the system.

Microwave channels between Midland and Corsicana will number 20. They will be used both for voice communications and for telemetering and supervisory control.

All stations except the one at Merkel will telemeter information on pressure and other station functions to Dallas. Merkel is only a 350-hp. station and, for the time being at least, will probably telemeter only flow data.

The channels will replace two pairs of private telephone wires, plus other carrier equipment.

Magnolia says that an important aspect of the new system will be that it will provide static-free channels and also relieve the existing circuits, which are becoming loaded.

The system was designed for possible future connections with other stations and expansion to 120 channels. A spokesman says that "a number of other stations in West Texas could be tied in to provide remote supervisory control at some future date, if such is deemed feasible."

What's New / IN TRANSPORTATION

The Federal Power Commission will hear oral arguments this week on proposed rate boosts of three companies totaling $18,722,100.

An annual rate increase on wholesale sales of $9,734,400 is being sought by Northern Natural Gas Co., and of $334,000 by Permian Basin Pipe Line Co., an affiliate.

Issues in this case, which will be argued Tuesday, will be limited to what constitutes a proper rate of return and how costs should be allocated between the jurisdictional and nonjurisdictional sales of the two companies.

On Friday, Panhandle Eastern Pipe Line Co. will argue its request for a wholesale rate hike of $8,653,700 a year.

The issues to be discussed include rate of return and income taxes.

•

Hope Natural Gas Co. has asked the Federal Power Commission for permission to raise its rates by $3.6-million a year.

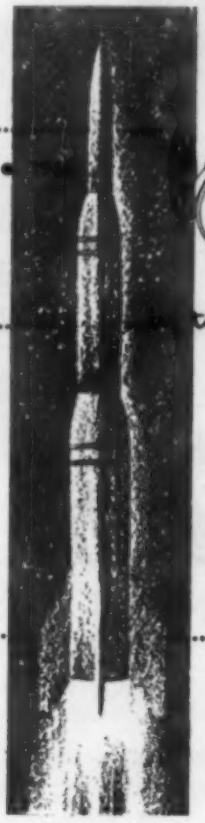
The company is now collecting three previous increases, subject to refund, amounting to approximately $11-million.

If its latest rate hike is granted, the company will earn a rate of return on its production properties of 10% and on its other properties of 6.75%, as compared with a return of 6.5% now being collected on the increases subject to refund.

•

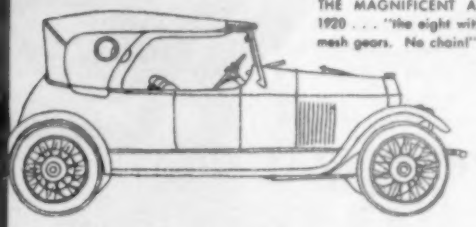
The Farmers Union Central Exchange has completed its $5-million products pipeline from Glendive, Mont., to Minot, N.D. (PW—Mar.11 '60,p41).

The 8-in. line will carry gasoline, diesel, and burner fuels to Farmers Union's own terminal at Glendive and to a terminal of the Carter division of Humble Oil & Refining Co. Capacity of the line is 15,000 b/d.



1920 •

ANOTHER MILESTONE



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W. P. Gee

M. F. Granville

WILLIAM P. GEE has been elected vice-president and assistant to the senior vice-president of Texaco Inc., New York, and **M. F. GRANVILLE** succeeds him as vice-president in charge of the petrochemical department. Granville has been general manager of that department since 1958. Gee, who has been with Texaco since 1927, was elected president of Texaco Development Corp. in 1947. Four years later, he transferred to the parent company as assistant to the president. He became president of Texas-U.S. Chemical Co., jointly owned by Texaco and U. S. Rubber Co., in 1954, and last year, he returned to Texaco as vice-president in charge of the petrochemical department. Granville, who joined the company in 1939, became superintendent of the chemicals division at the Port Arthur refinery in 1955. He moved to New York as general manager of the petrochemical department in 1958.

TURNER L. KUNKEL, who has been in the exploration department of Texaco Inc. at Houston since 1957, transfers to its Los Angeles producing division as manager. He succeeds **J. Harold Puls,** who will retire on Jan. 1. **Dosh T. McCreary** succeeds Kunkel as chief geophysicist of Texaco's exploration department at Houston. McCreary was formerly assistant chief geophysicist there.

DAVID HAUN succeeds **J. G. Stout** as personal assistant to the president of Shell Oil Co. of Canada, Ltd., in Toronto. Stout has been appointed area stratigrapher in Calgary. Haun was formerly a petroleum engineer in Shell's Calgary and Regina offices.

ROY J. DIWOKY has been elected to the newly created position of chairman of Commonwealth Oil Refining Co., Ponce, Puerto Rico, and **Sam H. Casey** succeeds him as president and chief executive officer. Casey was formerly executive vice-president of the company.

HUGH J. DAVIS has joined Texas Gas Exploration Foreign, C.A., in Calgary, as division landman. The company is a subsidiary of Texas Gas Exploration Corp., Houston, which was recently organized for oil and gas exploration and production in Canada. Davis was formerly associated with Devon-Palmer Oils, Ltd., in Calgary. In his new position, he will supervise drilling agreements, and the acquisition and maintenance of oil and gas leases.

W. T. THAGARD has been elected vice-president of Texas Eastern Transmission Corp., Houston. His initial assignment will be to direct and expedite Texas Eastern's diversification activities in the field of carrying coal by pipeline. Thagard joined Texas Eastern in 1947 as an administrative engineer. When the plans and economic research department was formed in 1955 to explore areas of logical diversification for Texas Eastern, Thagard was promoted to direct the activities of the department. In 1958, when the activities of the department were expanded and reorganized as the coordinating and planning department, Thagard was named manager, a position he has held up to this time.

W. T. Thagard

M. P. Nelson

MARLIN P. NELSON moves up to assistant director of the advanced management and methods division of Sun Oil Co., at Marcus Hook, Pa. Nelson will work with **Paul D. Barton,** director of the division, and **John F. Harron,** who will become director when Barton retires later this year. Nelson, who has been with Sun since 1948, was named assistant process engineer in the manufacturing engineering division in 1953. He has been senior chemical engineer in advanced management and methods since the division was organized in 1958. The division is involved in increasing the efficiency of refining operations, in incorporating new techniques in instrumentation and controls, and in improving organizational lines and work methods.

CERTIFICATES OF APPRECIATION will be presented to 23 oil men for their contributions to the oil industry at the American Petroleum Institute's annual meeting in Chicago next week. Recipients of certificates to be given by the production division are: **John R. Evans,** Standard Oil Co. (Ind.), Chicago; **C. E. Haven,** National Bureau of Standards, Washington, D.C.; **Edgar Kraus,** Atlantic Refining Co., Dallas; **Mercer H. Parks,** Humble Oil & Refining Co., Humble division, Houston; **M. L. Powers,** The University of Oklahoma, Norman, Okla.; and **Walter F. Rogers,** Gulf Oil Corp., Houston. Three certificates to be given by the marketing division will go to **C. M. Blickensderfer,** retired from Sinclair Refining Co., New York; **C. J. Guzzo,** Gulf Oil Corp., Pittsburgh; and **B. L Ray,** retired from the Esso Standard division of Humble Oil & Refining Co., New York. Six recipients in the transportation division will be: **R. A. Brannon,** Humble Pipe Line Co., Houston; **R. H. Ewing,** retired from Cities Service Oil Co., Bartlesville, Okla.; **R. K. Kelly,** Tidewater Oil Co., New York; **L. E. Reed,** Mobil Oil Co., New York; **C. E. Spahr,** Standard Oil Co. (Ohio), Cleveland; and **E. E. Wickman,** Shell Oil Co., Los Angeles. **Donald P. Jones,** Sun Oil Co., Philadelphia, will be the recipient of the certificate given by division of finance and accounting, and **G. R. Lake,** Union Oil Co. of California, Brea, Calif., will be given a certificate for his work in fundamental research. The committee on crude oil measurements will give a certificate of appreciation to **George H. Supple,** Mobil Oil Co., Los Angeles. Certificates from the committee on public affairs will go to **Harold L. Curtis,** retired from Shell Oil Co., New York, and **Richard Rollins,** Atlantic Refining Co., Philadelphia. The safety committee will give certificates to **James E. Hill,** Union Oil Co. of California, Los Angeles, and **Oliver W. Johnson,** Standard Oil Co. of California, San Francisco. **John C. Ruddock,** Richfield Oil Corp., Los Angeles, will be the recipient of the medical advisory committee award.

PHILIP S. JUSTICE has been transferred to the newly created position of special assistant to **Joseph G. Pew,** Sun Oil Co.'s senior vice-president in charge of production. Justice will conduct a series of studies of certain of Sun's undeveloped oil properties, including economic analyses of the company's policies and methods of acquisition, evaluation, and development. Justice will continue to be located in Denver, where he was formerly manager of Sun's Rocky Mountain division. **William W. Walmsley,** assistant division manager in Denver since 1956, succeeds Justice as manager there.

P. S. Justice

D. T. Whalen

DONALD T. WHALEN moves up to marketing manager of Tidewater Oil Co., with headquarters in Los Angeles. He was formerly marketing manager of Tidewater's western division, including six western states and Hawaii. In his new position, he succeeds **J. Ronald Getty,** who was recently named president and general manager of Tidewater's new European subsidiary, Veedol International.

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CHARLES E. NELSON, JR., is the new president of Waukesha Motor Co., Waukesha, Wis., succeeding **James E. DeLong**, who is retiring. Nelson was formerly executive vice-president. **J. G. Swain** has been elected a vice-president of Waukesha, and **L. W. Youker** secretary-treasurer. **N. H. Willis** is the new vice-president of engineering, and **J. J. Kleinbrook** is the new assistant secretary and assistant treasurer.

F. J. Nunlist

C. E. Nelson, Jr.

FRANK J. NUNLIST has been appointed to the newly created position of vice-president, operations, of Worthington Corp., Harrison, N. J. He will be responsible for the activities of the company's 16 domestic operating divisions in ten states, and for regional engineering and service activities. Nunlist has been with Worthington since it acquired L. J. Mueller Furnace Co. in 1954. He then became executive vice-president of Worthington's Mueller Climatrol division, and became a group vice-president for Worthington in 1958.

JAMES F. WARD is the new assistant general sales manager of petroleum and chemical sales for E. Brooke Matlack, Inc., Philadelphia, liquid and bulk transporters, and **Joseph J. Stefanec** is the new assistant to the president. Ward, who joined Matlack in 1955, was most recently New York district manager, and Stefanec joined the company in 1958 as assistant traffic manager, a position he has held to the present time. **James F. Rehr** has joined Matlack as district sales representative in the New York area. He has been an administrative assistant with Bush Terminal Co.

LOUIS J. WERNERT is the new sales representative at Odessa, Tex., for the pipe inspectors division of Plastic Applicators, Inc. He was formerly a sales engineer for another company in the Permian Basin region of Texas and in New Mexico. In his new position, Wernert will be involved in drill pipe and tubular goods inspection services in the Permian Basin area.

CHARLES E. CRAFT has joined the Republic rubber division of Lee Rubber & Tire Corp., as a field representative, with offices in Midland, Tex. He will be involved in sales in the West Texas and New Mexico area which is the responsibility of Republic's southwest district office, at Houston. He has been associated with the Oilwell Supply Division of U.S. Steel Corp., and the Thermoid division of H. K. Porter Co. Since 1958, he has been with Southeastern Drilling Corp., serving as office administrator and material supervisor in Teheran, Iran, and Calcutta, India.

BOB ALTENREID has joined Chris Well Servicing Co., Ltd., and affiliated companies. He was formerly co-owner and vice-president of Maverick Construction Co., and has been city sales representative for Magnet Cove Barium Corp. in Oklahoma.

VIRGIL L. ACKERMAN has joined Motorola, Inc., as an industrial communications representative in Louisiana, Mississippi, and the Gulf Coast of Texas. He will be responsible for the sale of Motorola microwave equipment to chemical, power, pipeline, and oil companies with heavy communications requirements. Ackerman, who has been associated with the pipeline industry for the past five years, will be located in Motorola's Houston office.

M. D. Hartsell

J. A. Beaird

J. A. Carrigan

R. A. Mercer

M. D. HARTSELL, J. A. CARRIGAN, R. A. MERCER, and J. A. BEAIRD have new assignments in the field sales management of Jones & Laughlin Supply Division. Hartsell has been appointed district sales manager at Wichita, Kan., succeeding Carrigan, who has been named city sales manager at Los Angeles. Hartsell was formerly J&L's resident salesman at Jackson, Miss. Carrigan succeeds Mercer, who is now city sales manager in New Orleans. Beaird, formerly district sales manager at Great Bend, Kan., has been transferred to Bartlesville, Okla. as district sales manager. J&L's South Louisiana district sales office has been moved from new Orleans to Lafayette, with **C. E. Rogers** as sales manager.

TROY TIPTON is in charge of the new Hennessey (Okla.) store of Bradford Supply Co., a division of Atlas Bradford Co. The store will serve the area as a sales and stocking point for all types of drilling and production equipment. Tipton was formerly manager of Bradford's store at Ada, Okla. **W. E. Swafford** is salesman at the Hennessey location, and **Max Nelson** will handle inside sales there.

D. Salls

W. B. Boyum

DAVID SALLS is the new manager of gas industry sales for Cooper-Bessemer Corp., Mt. Vernon, Ohio, and **WILLIAM B. BOYUM** succeeds him as manager of gas turbine sales. Salls directed the company's effort in gas pipeline projects before he became manager of gas turbine sales. Boyum, who recently joined Cooper-Bessemer, has been responsible for new products and new markets for the cryogenic machinery division of Air Products, Inc., and for Dynamic Research, Inc. He has also been involved in design engineering and special projects in the gas turbine department of Westinghouse Electric Corp.

ROBERT J. RIGGS has been promoted to foreign sales representative in export sales for Ethyl Corp., with offices in New York. He will be responsible for sales of Ethyl products to the oil and related industries in Europe and the Far East, with the exception of Japan. Riggs has been a chemical engineer in refinery technology in Ethyl's research and development department, and was most recently refinery technologist in the sales department's southern region. Before he joined Ethyl, Riggs was associated with DX Sunray Oil Co. in Duncan, Okla.

REX BIRCKET joins Trinity Steel Co. as custom sales representative in the Tulsa area. Trinity Steel, with plants in Dallas and Francesville, Ind., is a custom steel fabricator serving the refinery, petrochemical, and processing industries. Bircket has been associated with several oil companies, has been a sales engineer for an equipment supply house, and has had his own business as an independent manufacturer's representative.

HARRY P. WOODSON has joined Continental-Emsco Co. as galvanizing superintendent at its Houston plant. He was previously employed by another galvanizing plant in the Texas Gulf Coast area.

M. A. Foreman

F. C. Ratcliff

MARION A. FOREMAN has been promoted to the newly created position of national representative, rock bits, for Hughes Tool Co., Houston, and **FRANK C. RATCLIFF** succeeds him as regional manager for Hughes in Midland, Tex. Foreman, who joined the Hughes sales organization in 1937, has been Texas Gulf Coast district sales manager, Gulf Coast division manager, and most recently Midland regional manager. Ratcliff, with the company since 1956, was most recently division sales manager at Houma, La.

L. F. A. MITCHELL has been appointed vice-president, sales, for Vitro Engineering Co., New York. For the past eight years, Mitchell has been vice-president and director of Burns & Roe, Inc. He has also been general sales manager of Sperry Products, Inc., and division manager, apparatus group, for Canadian Westinghouse Co.

FELIX R. HOUSE has joined Lucey Products Corp. as a special representative in Dallas. **Randolph L. Griswold**, Lucey vice-president, is division manager there.

J. C. (Hap) STATON has been appointed Gulf Coast manager for Eastman Oil Well Survey Co., Denver. Staton joined Eastman in Lafayette, La., in 1941. He will maintain offices in Houston, headquarters for the Gulf Coast division, which covers the offshore and inland areas.

J. C. Staton

J. L. Reed

JAY L. REED moves up to manager of employee relations for Fluor Corp., Ltd., Los Angeles. Reed, who joined Fluor in 1949, was most recently supervisor of employee relations. In his new position, Reed will be responsible for the company's wage and salary program, domestic and foreign employment, and employee benefits and training. Before his employee relations assignment, Reed was administrative assistant to the vice-president of engineering and construction.

R. T. Oliver, Jr.

W. A. Carroll, Jr.

WILLIAM A. CARROLL, JR., moves up to manager of marketing, and **R. T. OLIVER, JR.**, to sales manager for domestic operations, for the industrial silencer division of Burgess-Manning Co. Both men will be located at the company's headquarters in Dallas. Carroll was formerly sales manager, with offices in Dallas, and Oliver was New York district sales manager. In his new position, Carroll will coordinate over-all sales activities, including a newly established international operation.

T. L. PARRISH has joined Hunt Tool Co. as service representative in the Houston area. He will specialize in section and liner milling operations, and will solicit sales and rentals of such Hunt products as stablizers, reamers, and drill collars. He was formerly general manager of Superior Oil Tool Co., and has been associated with A-1 Bit & Tool Co. as district manager in Odessa and Corpus Christi.

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Why Not a General Overhauling?

WHILE INTERIOR DEPT. OFFICIALS are toying with the idea of making shifts in the oil imports control plan, why not go all the way and give it a general overhauling?

There is nothing wrong with the idea of gearing imports to refinery runs, a method which PETROLEUM WEEK advocated long before such a plan was adopted into the current mandatory program. But there is a wrong to any plan, which has as its purpose the "sharing of the wealth" on virtually a socialistic basis, and that is what is happening under the present method that permits a traffic in quotas.

The fight of the independent producing segment of the industry was for control of imports, to keep the flood of foreign oil coming into this country from stagnating the domestic industry. But under present methods, the producing segment, particularly the smaller independents, still is stagnated.

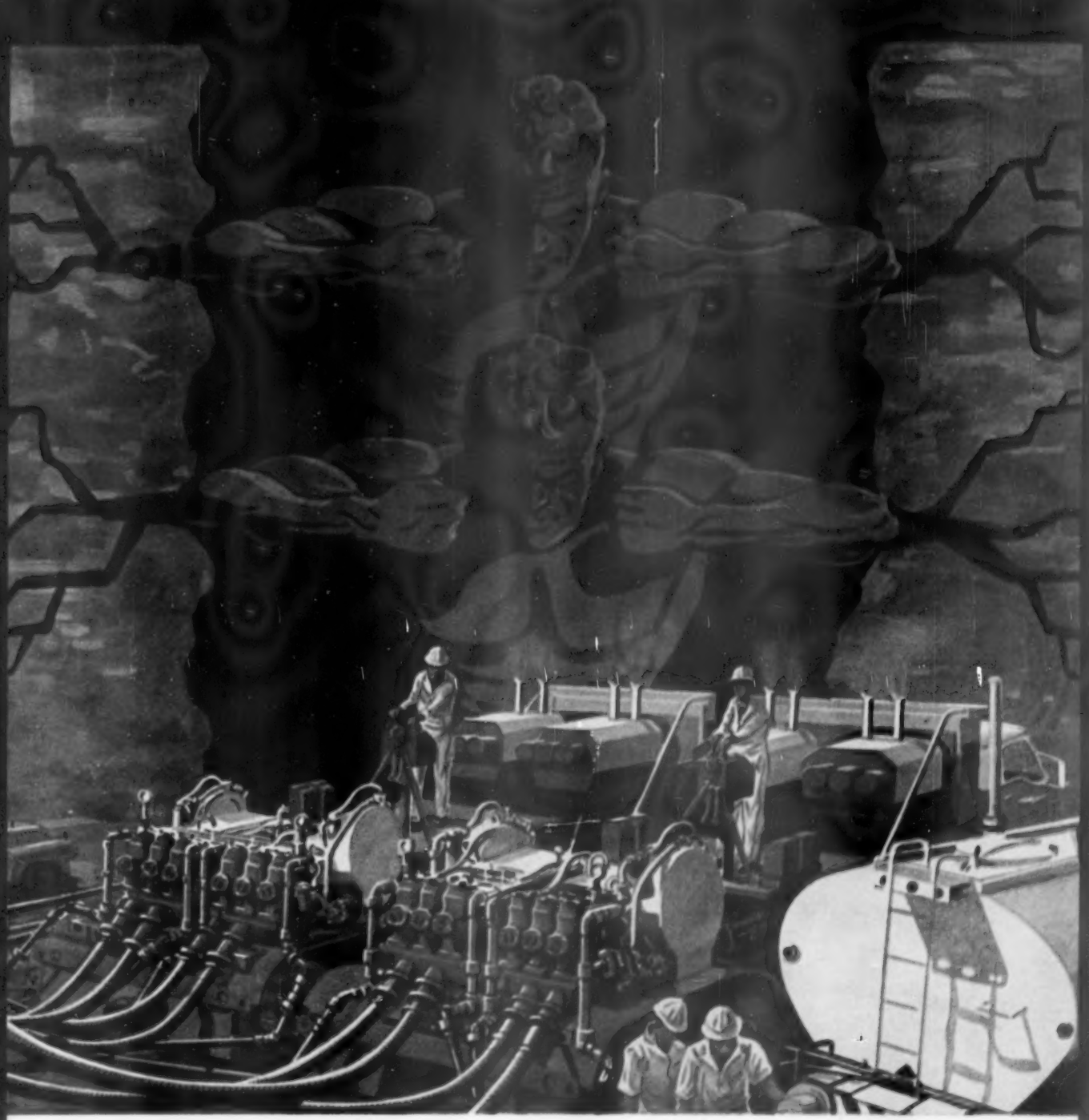
As the Independent Petroleum Assn. of America pointed out in its statement of policy on imports at its recent annual meeting in Dallas, demand has increased by more than 600,000 b/d since 1957. But there has been no increase in domestic crude production.

THIS SHOULD BE SUFFICIENT EVIDENCE that there is something wrong with parts of the present plan. We do not think the refinery run principle is wrong. We also agree that every refiner in the country, large or small, is entitled to a quota.

But at the same time, if the refiner who receives a quota is not able to use the oil in his own plant, then the quota should be tossed back into the pot for redistribution to those who can utilize it. To permit him to trade this quota to a coastal refiner at prices that range upwards to more than $1 per barrel is nothing more than industry subsidizing industry by government sanction. In other words, those who can utilize the quotas are paying the inland refiner a set figure simply because he happens to be in business.

Or to make it more plain, it's the same thing as a man building a service station in the middle of the desert, and then asking his competitors to build a highway past his door in order that he might get their business.

OUR FEELING is that it never was the intention of those within the producing segment of the industry to advocate or sanction such an operation when they sought import controls. Their only aim was to keep the domestic industry strong through strong markets for their crude.



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Many of the tools, techniques and products recently developed by Dowell for improving well stimulation treatments are being used effectively in *secondary recovery* operations. For example, *Rockshock** — a new service using implosion capsules to lower injection pressures; *Abrasijet** — a service used to clean the formation face and condition the zone for better fluid acceptance; *Ezeflo** — a low-pour-point surfactant used to lower water injection pressure; *Slick Water* — a friction-reducing agent used to cut pumping pressures by more than half during stimulation treatments; and a special agent used to remove calcium sulfate and other scale deposits from formations and down-hole equipment. These are only a few of Dowell's new services and products — more new ideas are on the way. If you're involved in secondary recovery work, it will pay you to *dial Dowell*. Dowell, Tulsa 1, Oklahoma.

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